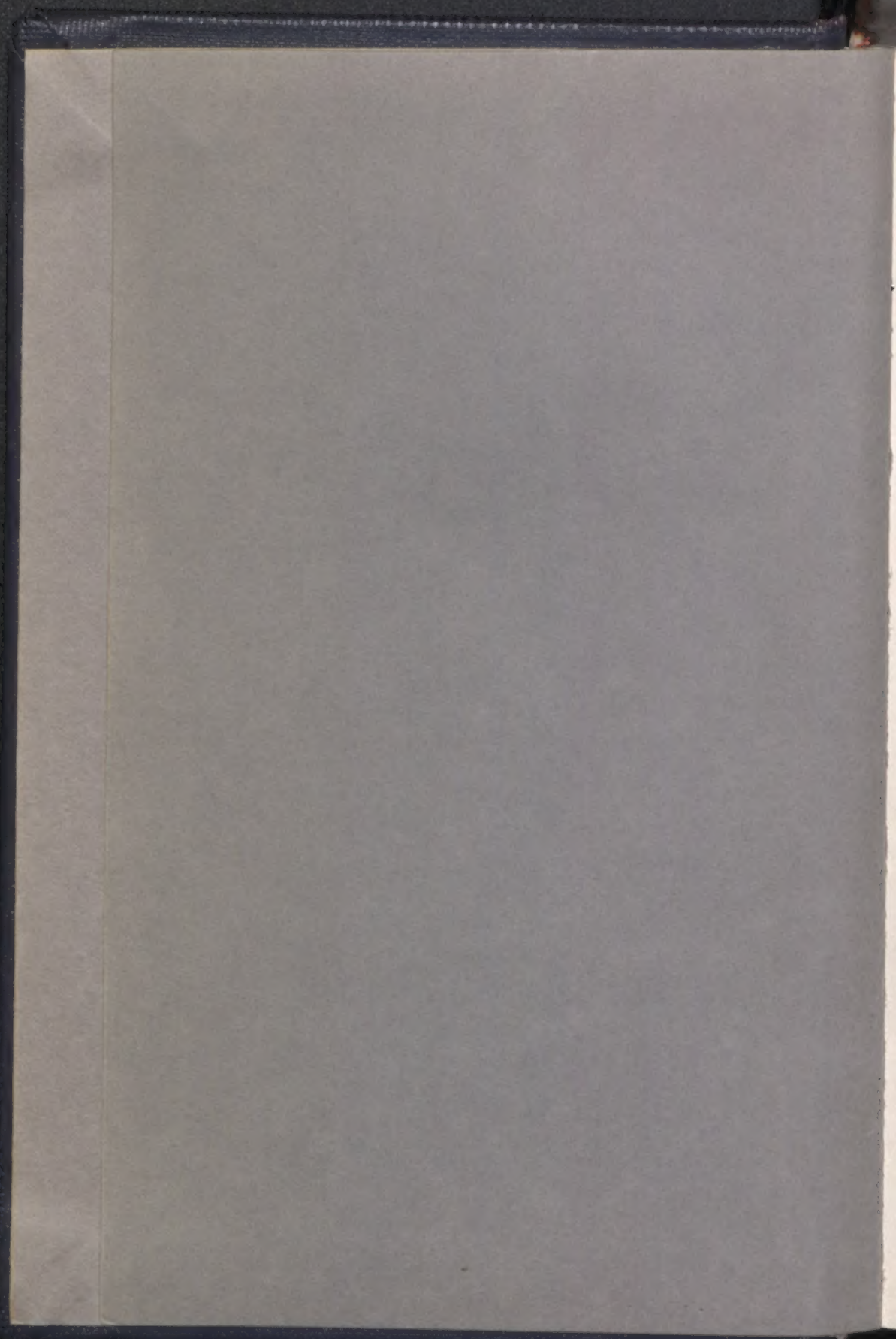


THE
GEORGE
WASHINGTON
UNIVERSITY

CATALOGUE



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Summer Sessions Bulletin 1961

Composite Catalogue 1961-62

College of General Studies Bulletin 1961-62

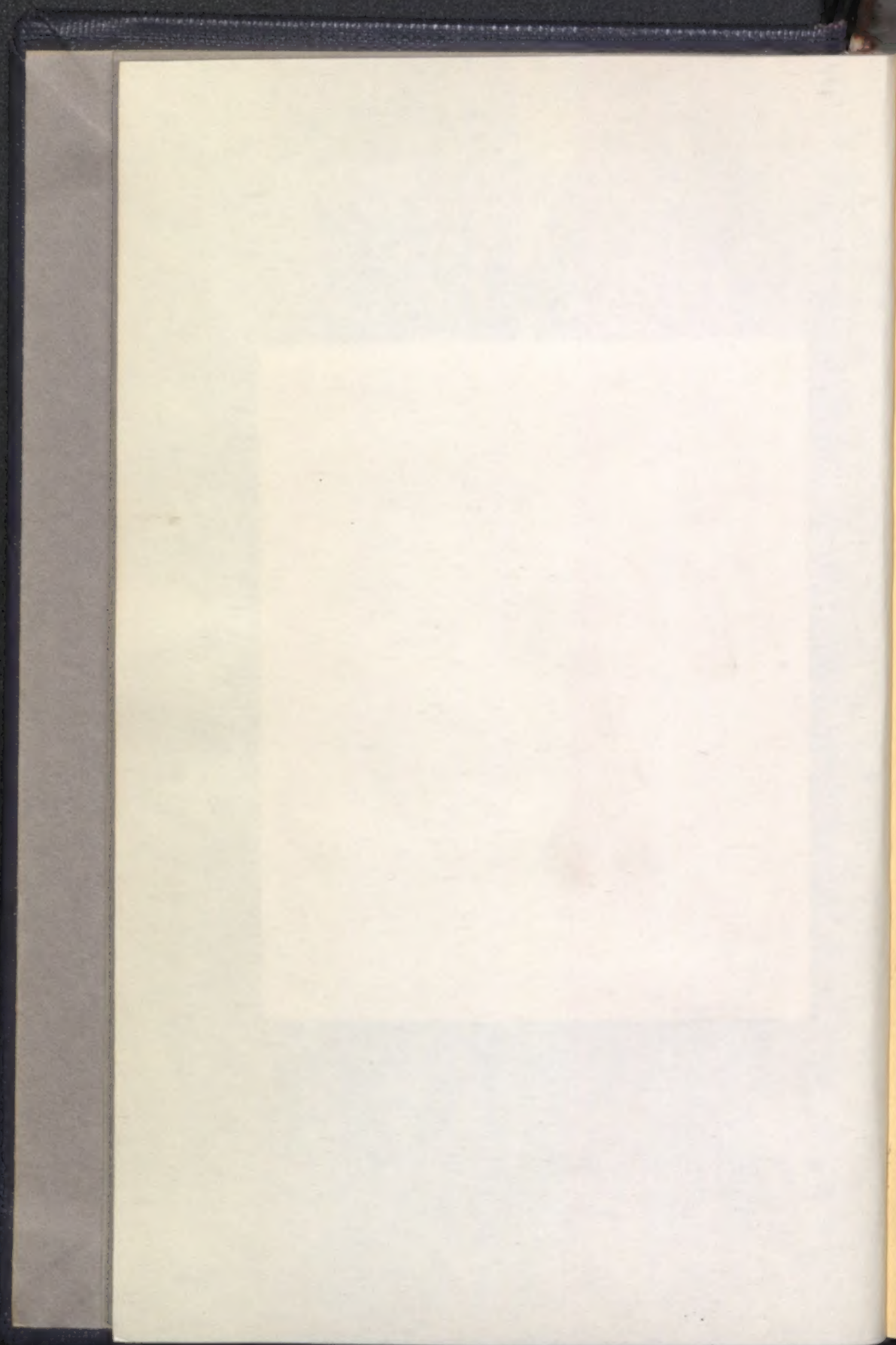
School of Medicine Bulletin 1961-62

Law School Bulletin 1961-62

School of Engineering Bulletin 1961-62

School of Education Bulletin 1961-62

Summaries of Doctoral Dissertations 1961



THE
GEORGE
WASHINGTON
UNIVERSITY

BULLETIN

THE SUMMER SESSIONS
1961



WASHINGTON 6, D. C.
DECEMBER 1960

VOL. LX

No. 5

CORRESPONDENCE DIRECTORY

Detailed information may be obtained by addressing inquiries as indicated below. For any information not included here, please write to the Director of Admissions, The George Washington University, Washington 6, D. C.

Information concerning courses of instruction and the programs of the several colleges and schools will be found in separate issues of the University Bulletin, which are listed on the inside back cover.

Admission.....Director of Admissions, Building C
 Air Science (ROTC).....Director of Air Science, Chapin Hall
 Alumni Association.....Alumni Office, Bacon Hall
 Foreign Students.....Adviser to Foreign Students, Building T
 Graduate Study

In Arts and Sciences

Master's degrees.....Dean of Columbian College
 Doctor of Philosophy.....Dean of The Graduate Council

In Education.....Dean of The School of Education

In Engineering.....Committee on Graduate Studies, School of Engineering

In Law.....Dean of the Law School

In Accounting, Business Administration, Business and Economic Statistics,
 Economic Policy, Hospital Administration, International Affairs, Personnel
 Administration, Public Administration, Public Affairs.....Dean of
 The School of Government, Business, and International Affairs

Housing

Men.....Director of Men's Activities, Building Q
 Women.....Director of Women's Activities, Woodhull House
 Scholarships.....Chairman, Committee on Scholarships, Building T
 Student Employment.....Student Placement Office, 2114 G Street NW.
 Summer Sessions.....Dean of the Summer Sessions, Building T
 Transcripts of Records.....Registrar, Building C
 Veterans Education.....Director of Veterans Education, Building Q

THE SUMMER SESSIONS

1961

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PUBLISHED BY THE UNIVERSITY
AT WASHINGTON, D. C.
APRIL, JUNE, JULY, AUGUST, OCTOBER, NOVEMBER (2 ISSUES), AND DECEMBER (2 ISSUES)
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CALENDAR OF THE 1961 SUMMER SESSIONS

| | | |
|---|---------------|-------|
| Registration for eight-week term* (10 AM-8 PM) | June 19 | Mon. |
| Classes begin | June 20 | Tues. |
| Independence Day. Holiday..... | July 4 | Tues. |
| Applications for Oct. graduation due in Registrar's Office | Aug. 1 | Tues. |
| Eight-week term ends..... | Aug. 11 | Fri. |
| Master's theses of Oct. candidates due in appropriate dean's office..... | Aug. 11 | Fri. |
| Ed.D. and D.B.A. dissertations of Oct. candidates due in appropriate dean's office..... | Sept. 8 | Fri. |

THE LAW SCHOOL

| | | |
|---|-------------------|--------------|
| Registration for both sessions..... | June 12 | Mon. |
| First session begins..... | June 13..... | Tues. |
| Independence Day. Holiday..... | July 4 | Tues. |
| Last day of classes..... | July 24 | Mon. |
| First-session examination period..... | July 25-27 | Tues.-Thurs. |
| Registration for students attending second session only | July 28 | Fri. |
| Second session begins..... | July 31 | Mon. |
| Labor Day. Holiday..... | Sept. 4 | Mon. |
| Last day of classes..... | Sept. 8 | Fri. |
| Second-session examination period..... | Sept. 11-13 | Mon.-Wed. |

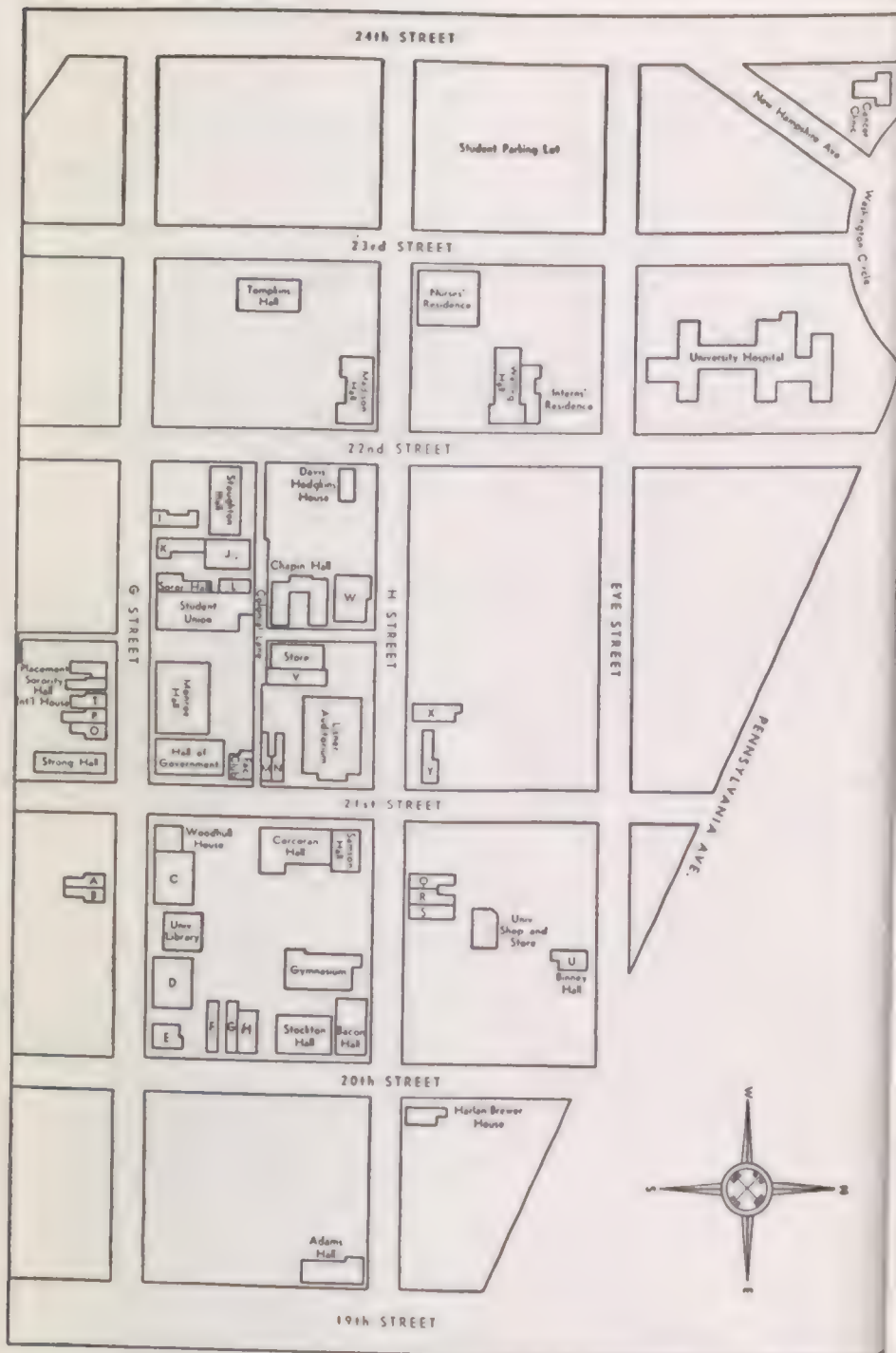
THE SCHOOL OF EDUCATION

| | | |
|--|---------------|-------|
| Twelve-week session: registration and first day of classes (9 AM-6 PM)..... | June 12 | Mon. |
| Nine-week workshop session: registration for first block (10 AM-8 PM)..... | June 19 | Mon. |
| Nine-week workshop session: first block classes begin | June 20 | Tues. |
| Twelve-week session: second three-week day course—registration and first day of classes (9 AM-6 PM)..... | July 3 | Mon. |
| Independence Day. Holiday..... | July 4 | Tues. |
| Nine-week workshop session: second block registration (9 AM-6 PM)..... | July 10 | Mon. |
| Six-week session: registration (9 AM-6 PM)..... | July 10 | Mon. |
| Nine-week session: second block classes begin.. | July 11 | Tues. |
| Six-week session: classes begin..... | July 11 | Tues. |

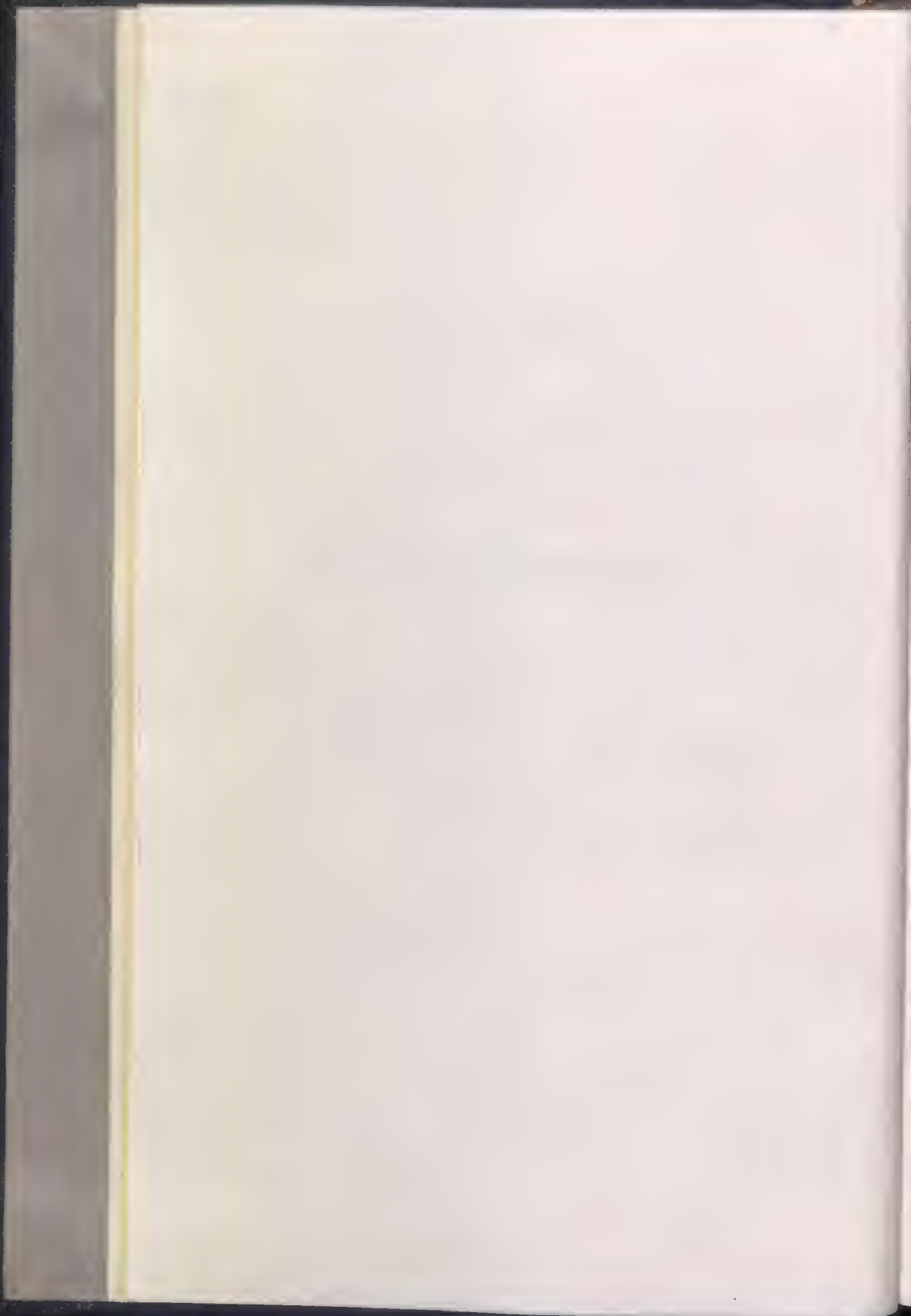
* For all schools and colleges offering courses in the Summer Sessions except the Law School and the School of Education.

| | | |
|---|-------------|------------------|
| Twelve-week session: third three-week day course—registration and first day of classes (9 AM–6 PM)..... | July 24 |Mon. |
| Twelve-week session: second half evening courses—registration and first day of classes Ed.D. and A.M. in Ed. comprehensive examinations | July 24 |Mon. |
| Nine-week session: third block—registration and first day of classes (9 AM–5 PM)..... | July 26 |Wed. |
| Applications for Oct. graduation due in Registrar's Office* | July 31 |Mon. |
| Twelve-week session: fourth three-week day course—registration and first day of classes (9 AM–5 PM)..... | Aug. 1 |Tues. |
| | Aug. 14 |Mon. |
| Registration for fall semester 1961–62..... | Sept. 21–23 |Thurs.–Sat. |

* Except students registering after August 1 for the first time in the 1961 Summer Sessions.



THE UNIVERSITY



THE BOARD OF TRUSTEES

The Board of Trustees of the University is composed of the President of the University ex officio and the following persons by election:

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THE UNIVERSITY

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington. During his public life he urged the establishment of such an institution and in his will he left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

Columbian College in the District of Columbia was chartered by an act of Congress of February 9, 1821. In 1873 the name was changed to "Columbian University" and in 1904 to "The George Washington University".

The George Washington University includes fourteen colleges, schools, and divisions. Many of these offer programs of study in the Summer Sessions, as described later in this Bulletin.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. Such accreditation is vital to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The Law School is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association. The School of Pharmacy is accredited by the American Council on Pharmaceutical Education. It is a member of the American Association of Colleges of Pharmacy. The School of Engineering is on the accredited list of the Engineers' Council for Professional Development. The School of Education is a charter member of the American Association of Colleges for Teacher Education and is accredited by the National Council for the Accreditation for Teacher Education.

LOCATION

The George Washington University is in downtown Washington, four blocks west of the White House and east of the Potomac River with its extensive parkway. Readily accessible to the University are many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Army, the Department of the Navy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor; as well as the National Archives, the Capitol, the Library of Congress, the National Academy of Sciences, the Pan American Union, the National Gallery of Art, and the Corcoran Gallery of Art.

EDUCATIONAL FACILITIES

The University Library.—The University Library contains approximately 352,000 volumes and, with the exception of the law and medical collections, is housed in the Library Building.

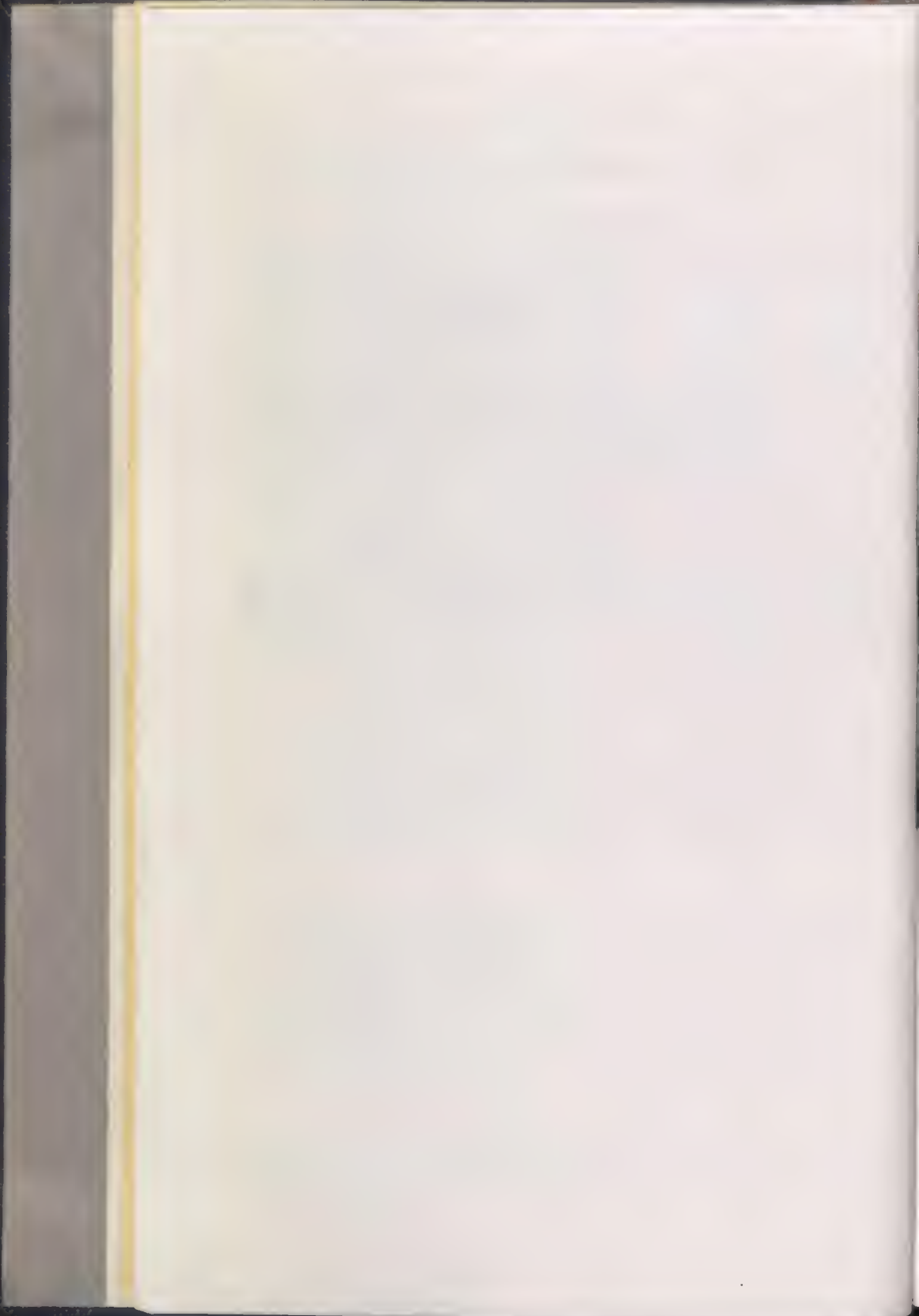
Regulations governing the use of the library, the circulation of books, and the use of reserve books and periodicals are available at the service desks of the Library.

Other Library Facilities in Washington.—The student has access also to the Library of Congress, the Public Library of the District of Columbia and its branches, the Library of the Pan American Union, the Library of the Bureau of Railway Economics, the Library of the United States Department of Agriculture, the Library of the United States Office of Education, the National Library of Medicine, the Library of the Smithsonian Institution, and many other great special collections of the government departments.

Research Facilities of Washington.—The arrangement of the summer schedule of classes permits the full-time student to avail himself of the opportunity to study, at first hand, the working of the Federal Government and so to form a background for intelligent and useful citizenship.

In the departmental libraries of the Federal Government are a multitude of reports made by eminent specialists in all fields of science on the results of study and research in the bureaus, experimental stations, laboratories, museums, and observatories of the Nation.

In addition to the governmental collection the student has access to the research facilities of such scientific and educational groups, whose headquarters are situated in Washington, as the Carnegie Institution, the American Council on Education, the American Council of Learned Societies, the National Academy of Sciences, the National Research Council, the National Education Association, and the National Geographic Society.





THE
GEORGE WASHINGTON UNIVERSITY
INVITES YOU TO STUDY THIS SUMMER IN THE
NATION'S CAPITAL





The air-conditioned classrooms of the Hall of Government and James Monroe Hall are just a few minutes' walk from the Department of State, a few minutes' ride from the Library of Congress.

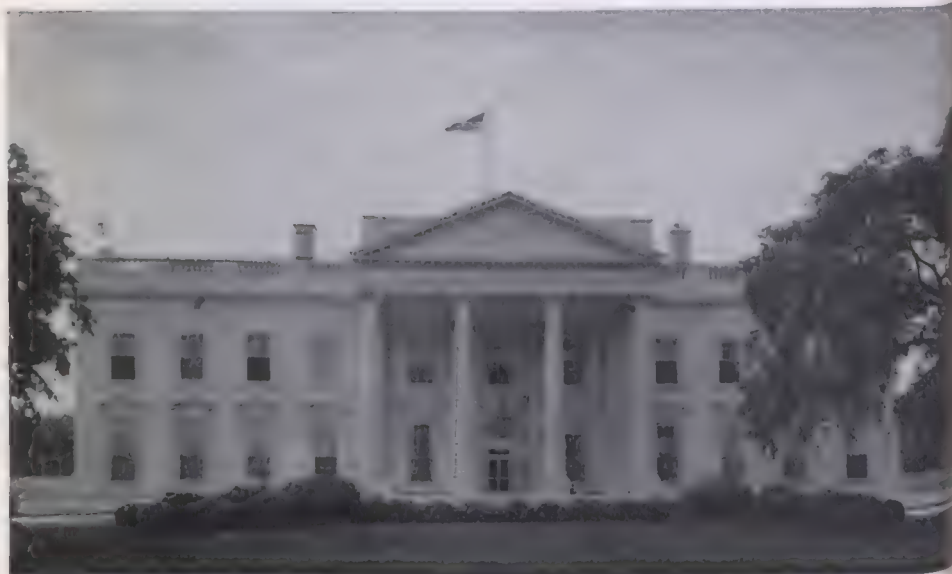




The five-day academic week at The George Washington University leaves students time to visit the historic shrines of the Nation's Capital, to attend musical and dramatic events in the Carter Barron Amphitheater, and to participate in the Summer Sessions recreation programs.

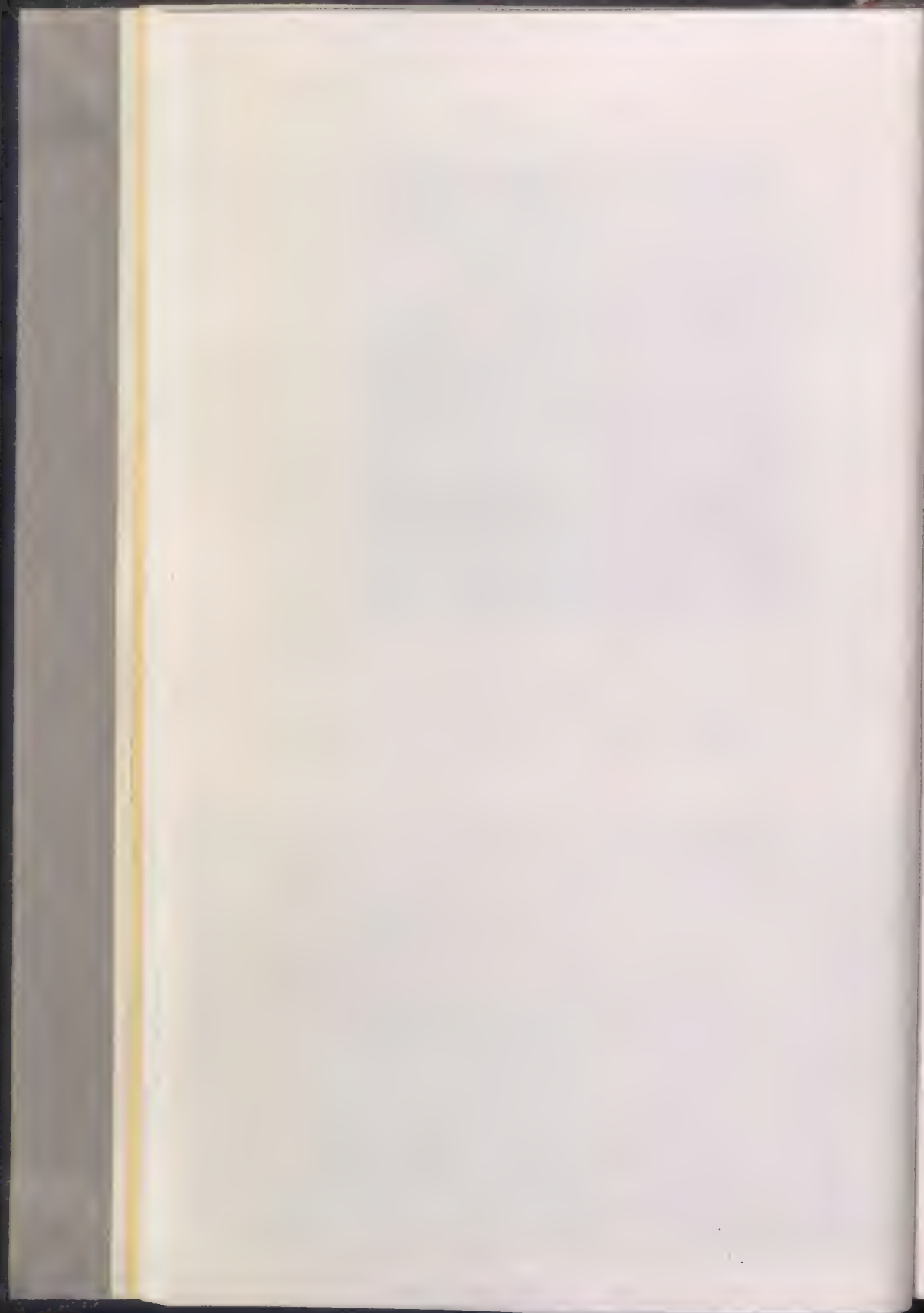


You will never forget your summer of study at
the campus four blocks from the White House.



THE SUMMER SESSIONS

1961



THE SUMMER SESSIONS

The work of the Summer Sessions has been planned to meet the needs of full- and part-time students.

During the summer of 1961, courses are offered in the Junior College; Columbian College (the senior college); the Law School; the School of Pharmacy; the School of Education; and the School of Government, Business, and International Affairs.

ADMISSION

APPLICATION FOR ADMISSION

The application form for admission may be obtained from the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D. C.; telephone: Federal 8-0250, extension 344. The completed form should be returned to the Office of the Director of Admissions, with an application fee of \$10 for a degree candidate or \$5 for a nondegree candidate. The degree candidate must attach to his application a recent photograph, signed by him.

THE STUDENT SEEKING A DEGREE

An applicant from a secondary school must send to his high school principal the high school record form provided by the University, with the request that the completed form be mailed to the Office of the Director of Admissions.

An applicant who has attended one or more institutions of higher learning must request each registrar to mail to the Office of the Director of Admissions a transcript of his record, even though credits were not earned. An honorable dismissal is required from the institution last attended.

The appropriate report of Graduate Record Examination, when available, should accompany application to graduate degree candidacy.

THE STUDENT NOT SEEKING A DEGREE

The student not seeking a degree from this University should apply for admission to the Division of University Students, a nondegree-granting division which makes the work of the University available to the following three types of applicants:

1. The student registered for a degree at another institution is admitted to the extent that facilities permit. No transcript of record is required, but an official statement of his eligibility to return to his institution must accompany his application for admission.

2. The student over 21 years of age who is not working for a degree in this or another institution may be admitted to take courses for which he has adequate preparation, as determined by the department concerned. No transcript of record is required.

3. The student under 21 years of age who is not seeking degree candidacy here or elsewhere may be admitted if he meets the entrance requirements of the Junior College (see page 17).

REGISTRATION

A student may not register for classes until the Office of the Director of Admissions has approved his admission to this University.

A student previously registered in this University who did not attend during the term preceding this registration must file an application for readmission well in advance of registration.

Registration for both sessions of the Law School summer term will be held June 12. *Summer students planning to take the New York Bar examination must register at this time for both sessions and complete both.* Students wishing to attend the second session only should register on July 28. Tuition fees are payable by the session.

In special instances, with the permission of the instructor, a person who has been admitted to the University may be registered as an auditor in a class without being required to take active part in the exercises or to pass examinations. No academic credit will be allowed for such attendance.

CHANGES IN PROGRAM OF STUDY

Changes in programs of study may be made only with the permission of the adviser or major professor and the dean or director of the college, school, or division concerned.

FEES AND FINANCIAL REGULATIONS

By authorization of the Board of Trustees, the following fees have been adopted:

TUITION FEES

| | |
|---|----------|
| For each semester hour* for which the student registers (except for work in the Law School, for courses in Departments of Instruction in the School of Engineering, for courses in the College of General Studies Off-Campus Division, for work toward a Master's degree in Engineering, and for work taken by a candidate for a Doctor's degree) | \$24.00 |
| For each semester hour for which the student registers in the Law School .. | 25.00 |
| For each semester hour for which the student registers for courses in Departments of Instruction in the School of Engineering | 25.00 |
| For each semester hour for which the student registers in the Off-Campus Division of the College of General Studies | 17.00 |
| For the degree of Doctor of Philosophy, Doctor of Education, or Doctor of Business Administration: | |
| For work† leading to and including the Council Fellowship or General examination‡ | 800.00 |
| For work leading to and including the final examination‡ | 800.00 |
| For the degree of Doctor of Juridical Science: | |
| For work leading to and including the final examination‡ | 800.00 |
| For the degree of Master of Engineering Administration: | |
| For work leading to and including the Comprehensive Examination‡ | 800.00 |
| For the degree of Master of Science in Engineering: | |
| For work leading to and including the Comprehensive Examination‡ | 700.00 |
| For the degree of Doctor of Science: | |
| For work leading to and including the Qualifying Examination | 1,200.00 |
| For work leading to and including the final examination | 1,200.00 |

* Payment of tuition for the Master's thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered "in residence" during this period. If the preparation of the thesis extends beyond the second academic year, it must be registered for again, and tuition paid on the same basis as for a repeated course.

† This fee does not cover the cost of tuition for undergraduate courses numbered 1 to 100.

‡ When a limited schedule is carried which extends the time of completion of the program of study to more than one year, the proportionate part of the charge may be fixed by the Treasurer.

ADDITIONAL COURSE FEES

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are due with the tuition fee for the course. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee, the individual student will be required to pay such additional charges as are determined by the department concerned.

GRADUATION FEES

Wherein the degree of Associate in Arts or Associate in Science is granted 10.00

Wherein a degree other than the Associate in Arts or Associate in Science degree is granted..... 25.00

Wherein an Advanced Professional Certificate in Education is granted..... 25.00

FEE FOR BINDING MASTER'S THESIS..... 6.00

FEE FOR PRINTING SUMMARY OF DOCTORAL DISSERTATION..... 85.00

SPECIAL FEES

Application fee, charged each applicant for admission as a degree candidate, nonrefundable..... 10.00

Application fee, charged each applicant for admission as a nondegree candidate, nonrefundable..... 5.00

Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable..... 5.00

Admission tests (when required)..... 6.00-12.00

Late-registration fee, charged each student who fails to register within the designated period..... 5.00

Change fee, charged each student for each change in program involving one course or more than one course..... 2.00

Withdrawal fee, charged each student who preregisters and withdraws prior to the regular registration..... 5.00

Service fee, charged each student for late payment of tuition (see "Payment of Fees")..... 2.00

Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees..... 5.00

For each examination to qualify for advanced standing and for each special examination..... 5.00

Laboratory checkout fee, charged each student in chemistry and pharmacy courses who fails to check out of the laboratory by the time set by the instructor..... 3.00

Transcript fee, charged for each transcript of record after the first..... 1.00

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of the University library; (4) medical attention and hospital services described below. These privileges, with the exception of the issuance of transcripts, cease when the student withdraws or is dismissed from the University.

Medical and Hospital Services.—These services include: (1) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examinations; (2) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration. All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special services must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

* Payable at the time of application for transfer or readmission.

Hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street, NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each session are due in advance at the time of registration.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

Registrations are for the session, and no refunds or rebates are allowed unless the registration is in advance and the course is dropped before the day of registration for the session involved.

A student who preregisters and withdraws prior to the date of regular registration will be charged a withdrawal fee of \$5.

In no case will tuition be refunded because of nonattendance upon classes.

Payments apply only to the session for which registration charges are incurred, and in no case will these payments be credited to another session or term.

Any student in chemistry or pharmacy who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a laboratory check-out fee of \$3. A student dropping a course before the end of the session must check out of the laboratory at the next scheduled laboratory period.

No permission to withdraw and no certificate for work done will be given a student who has not a clear financial record.

UNIVERSITY REGULATIONS

Students in the Summer Sessions are subject to, and are expected to familiarize themselves with, the University regulations as stated in the general catalogue.

Academic Credit.—The Summer Sessions are an integral part of the University. Academic credit for completed work will be given toward the appropriate degrees in the various colleges and schools of the University in accordance with their separate regulations and requirements.

Residence.—Summer Sessions work may be counted in residence but the candidate for a degree must satisfy the residence requirements of the school or college concerned as stated in the general catalogue.

Amount of Work.—No full-time student may take more than 9 semester hours of work during the eight-week session; no employed student, more than 6 hours.

In the Law School the maximum amount of work that may be taken in both sessions by a full-time student is 12 semester hours; by an employed student, 8 semester hours.

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the Stu-

dent or the University, the University Administration deems it advisable to do so.

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" office is maintained in the Student Union.

VETERANS EDUCATION

The Office of Veterans Education, Building Q, 2029 H Street NW., is a service bureau for eligible persons interested in studying at this University. It acts in a liaison capacity between the University and the Veterans Administration.

Those who are eligible are advised to consult this Office about the educational program of the University and the procedure for securing benefits before applying to the Veterans Administration for certification. The Veterans Administration is on Constitution Avenue at Twentieth Street NW., Washington 25, D. C.

PUBLIC LAW 634

(War Orphans Educational Assistance Act)

A child of a person who died of a disease or injury incurred or aggravated while on active duty in the Armed Forces during World War I, World War II, or the Korean Conflict may be eligible for educational assistance under this Act, if certain age requirements are met. In the case of a child who has not reached the age of majority, his guardian must make application for him to the Veterans Administration.

PUBLIC LAW 190

(World War II GI Bill Extension)

The educational benefits for World War II veterans terminated July 25, 1956, except that persons enlisting or reenlisting in the Armed Forces between October 6, 1945, and October 5, 1946, may count the entire period of such enlistment or reenlistment as war service for purposes of GI Bill benefits. Such enlistees have four years from the date that enlistment ended to begin training and nine years from that separation date to complete training under this provision.

PUBLIC LAW 550

(Korean GI Bill)

To be eligible under this Law, a veteran must have been in service between June 27, 1950 and January 31, 1955, and must no longer be on active duty.

At least thirty days prior to registration the veteran should apply to the Veterans Administration for a Certificate for Education and Training, for presentation to the University Office of Veterans Education at the time of registration. A photostatic copy of his DD214 must accompany the original application for certification.

PUBLIC LAWS 16 AND 894

(Vocational Rehabilitation)

Disabled veterans desiring vocational rehabilitation under either Law should apply to Veterans Administration for approval of their training objectives at least sixty days prior to registration.

STUDENT LIFE

SOCIAL AND RECREATIONAL PROGRAM OF THE UNIVERSITY

The summer social and recreational program includes regularly scheduled social, square, and folk dances on Lisner Terrace. For those who would like instruction and practice in dance, teaching sessions are provided. Get-acquainted teas and a carnival are also included in the program.

During the summer, notices of the many recreational and social opportunities offered in the Capital will be posted on a bulletin board in the Student Union.

LIVING ACCOMMODATIONS

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance. Forms for application, together with detailed information, may be obtained from the Director of Activities for Women, Woodhull House, 2033 G Street NW. or the Director of Activities for Men, Building Q, 2029 H Street NW.

Information concerning private rooming and boarding facilities near the University, for women students twenty-one years of age or older and for men students, may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls, except freshmen, under the age of twenty-one who are enrolled for 6 or more credit hours of academic work at the University and who are not living with their parents or relatives, may live outside the dormitory only with the permission and approval of the Director of Activities for Women, and upon receipt of written requests from parents. In no case will permission be granted for such girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Freshman girls may be domiciled outside the dormitory *only* with their parents or with immediate relatives with the written approval of their parents.

During the summer of 1961 the following residence halls will be open. Meals are served in the Student Union.

Women Students.—Dolly Madison Hall provides double rooms at \$40 a month a person.

Men Students.—John Quincy Adams Hall provides double rooms, with study alcove and bath, at \$40 a month a person.

Dormitory payments are due and payable in advance on the first day of each month. A student who fails to meet payments when due, but who makes his payment from the tenth to the fifteenth, inclusive, of the month in which payment is due, is charged a service fee of \$2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued rent and a reinstatement fee of \$5.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the various religious organizations of their own choice. Catholic, Jewish, and Protestant bodies sponsor these groups and form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

THE COLLEGES, SCHOOLS, AND DIVISIONS

Information concerning specific requirements for degrees is omitted from this bulletin. For such information, the student is referred to the general catalogue.

THE JUNIOR COLLEGE

The Junior College, which administers the first two years of the standard four-year college program in the liberal arts and sciences was established in 1930, as a part of the academic reorganization of the University. Prior to 1930, the four-year program had been administered by Columbian College since its organization in 1821.

The Junior College curricula continue the studies of a general cultural nature begun in the secondary schools, and lay a foundation for the more specialized work which is to follow.

The curricula offered in preparation for admission to Columbian College prepare students for advanced work in the fields of arts and letters and in science. They also serve as the first two years of the prelegal and premedical programs. The curriculum in Science meets the requirements for the first two years of the Bachelor of Science in Medical Technology curriculum offered by Columbian College in collaboration with the Department of Pathology and the University Hospital.

The Junior College also provides the preprofessional work required for admission to the schools of Pharmacy; Education; and Government, Business, and International Affairs.

In addition it provides the following two-year curricula in vocational training: Accounting, Home Economics, Physical Sciences, and Secretarial Studies.

THE DEGREES

The Junior College offers work leading to the degrees of Associate in Arts and Associate in Science.

ENTRANCE REQUIREMENTS

Admission is based on the following factors:

1. An acceptable certificate of graduation from an accredited high school, showing at least fifteen "units" *
2. The principal's statement that the applicant is prepared to undertake college work
3. Scores of the Scholastic Aptitude Test of the College Entrance Examination Board.

The Committee on Admission and Advanced Standing will consider the qualifications of an applicant who does not present all of the formal requirements stated above. The Committee may prescribe appropriate tests.

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

COLUMBIAN COLLEGE

Columbian College, the senior college of liberal arts and sciences, comprises the work of the junior and senior years and the Master of Arts and Master of Science disciplines.

THE DEGREES

Columbian College offers work leading to the following degrees: Bachelor of Arts, Bachelor of Science, Master of Arts, Master of Science, and Master of Fine Arts. In cooperation with the School of Medicine, Columbian College offers work leading to the combined degrees of Bachelor of Arts and Doctor of Medicine. In cooperation with the Department of Pathology and the University Hospital, Columbian College offers work leading to the degree of Bachelor of Science in Medical Technology.

UNDERGRADUATE MAJORS

Curricula leading to the degree of Bachelor of Arts are available in the following major fields:

| | |
|-------------------------------------|---------------------------------|
| American Thought and Civilization | Latin American Civilization |
| Art: | Mathematics |
| Art History and Theory, Drawing and | Philosophy |
| Painting, Sculpture, or Commercial | Physics |
| Art | Political Science |
| Biology | Psychology |
| Botany | Religion |
| Chemistry | Russian |
| Economics | Sociology and Anthropology |
| English Literature | Spanish American Literature |
| French Language and Literature | Spanish Language and Literature |
| Geography | Speech: |
| Geology | Speech |
| Germanic Languages and Literatures | Dramatic Art |
| History | Statistics |
| Journalism | Zoology |

Curricula leading to the degree of Bachelor of Science are available in the following major fields:

| | |
|-----------|-------------|
| Biology | Mathematics |
| Botany | Physics |
| Chemistry | Statistics |
| Geology | Zoology |

GRADUATE FIELDS

Graduate work leading to the degree of Master of Arts or Master of Science is offered in the following fields. In addition, programs can be arranged in combined fields subject to the approval of the Committee on Studies.

| | |
|--|------------------------------------|
| American Literary and Cultural History | Economics |
| Anatomy | English and American Literature |
| Art History and Criticism | English Literature |
| Biochemistry | French Language and Literature |
| Biology | Geography |
| Botany | Geology |
| Chemistry | Germanic Languages and Literatures |
| Chemotherapy | History |

Latin American Civilization
Mathematics
Microbiology
Museology
Pharmacology
Philosophy
Physics
Physiology
Political Science

Psychology
Religion
Religious Education
Sociology and Anthropology
Spanish American Literature
Spanish Language and Literature
Speech Correction
Statistics
Zoology

Graduate work leading to the degree of Master of Fine Arts is offered in the fields of painting and of sculpture.

ENTRANCE REQUIREMENTS

For the Bachelor's Degrees.—The degree of Associate in Arts or Associate in Science based on the appropriate curriculum in the Junior College, or the equivalent. Scholarship requirements may be somewhat higher than those for graduation from the Junior College.

For the Master's Degrees.—An approved Bachelor's degree from an accredited higher institution; an appropriate distribution of courses; and a superior quality of work in the major field.

THE GRADUATE COUNCIL

The Graduate Council offers work leading only to the degree of Doctor of Philosophy. There is no specified amount of graduate work required for this degree beyond the first full year of graduate study. However, each student may be assigned whatever additional graduate course work his committee deems essential to his doctoral program. A limited amount of this graduate work is offered by some departments in the Summer Sessions. A student wishing to work under the disciplines of the Graduate Council will consult the Dean of the Graduate Council for information concerning credentials and candidacy.

A pamphlet describing details of the Graduate Council program, together with a current list of fields of research offered by the Council, will be sent upon request by the Office of the Graduate Council.

THE LAW SCHOOL

The Law School offers work leading to the following degrees: Bachelor of Laws, Juris Doctor, Master of Laws, Master of Comparative Law, and Doctor of Juridical Science.

See "Registration", on page 12 for provisions applicable to students who plan to take the New York Bar examination.

ENTRANCE REQUIREMENTS

Unclassified Students.—A degree candidate in good standing at another law school which is a member of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student to earn credits for transfer to the other law school.

A member of the bar or a person, not a member of the bar, who is a graduate of a member school of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student.

Unclassified students participate in the work of the course and take examinations. Courses taken by unclassified students will not be credited toward degrees at this Law School.

For the Degree of Bachelor of Laws: No new students are admitted as candidates for the degree of Bachelor of Laws in the summer term.

The Juris Doctor degree is conferred as a recognition of completion with high rank of the full course, including experience in research and legal authorship. A student does not register as a candidate for this degree until his last year in the Law School. The degree of Juris Doctor will be discontinued effective with respect to students entering the Law School in the 1961-62 academic year.

For the Degree of Master of Laws.—A Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree from a member school of the Association of American Law Schools are required. Candidates for admission must have attained a *B* average on all work done for the Bachelor of Laws degree, except that, at the discretion of the Committee on Graduate Studies, applicants otherwise eligible may be admitted on proof of experience and attainment as an alternative.

For the Degree of Master of Comparative Law.—The following are required: (1) the successful completion of and graduation from a course in arts, philosophy, letters, or sciences, equivalent to graduation from a gymnasium, lycée, or lycee; and (2) graduation in law from a recognized foreign university where training was in Civil Law.

For the Degree of Doctor of Juridical Science.—The following are required: a Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree, earned with high rank, from a member school of the Association of American Law Schools, and outstanding capacity for scholarly work in the field of law.

Continuing Legal Education Students.—A simplified admission and registration procedure is used for members of the bar who wish to take courses on a noncredit basis.

THE SCHOOL OF PHARMACY

The School of Pharmacy offers work leading to the degree of Bachelor of Science in Pharmacy.

ENTRANCE REQUIREMENTS

An Associate in Arts degree based on the curriculum in Pharmacy in the Junior College, or the equivalent, is required.

THE SCHOOL OF EDUCATION

The School of Education prepares teachers, counselors, and administrators for the higher ranges of educational service and offers opportunities to teachers of experience to extend their education. The schedule of courses is arranged to meet the needs of employed students as well as those able to devote full time to their studies. It offers both graduate and undergraduate work.

THE DEGREES

The School of Education offers work leading to the following degrees: Bachelor of Arts in Education, Bachelor of Science in Home Economics, Bachelor of Science in Physical Education, Master of Arts in Education, and Doctor of Education.

ENTRANCE REQUIREMENTS

For the Bachelor's Degrees.—The satisfactory completion of two years of approved college work, or graduation from an approved two-year normal school, or the equivalent, is required.

For the Master's Degree.—A Bachelor's degree from an accredited college, or the equivalent, and the approval of the Committee on Admission and Advanced Standing are required.

For the Advanced Professional Certificate.—The Bachelor of Arts degree in Education or the Bachelor of Science degree in Physical Education from the School of Education, or the equivalent from another institution of higher learning; a Master's degree, from an accredited institution of higher learning, at least two years of successful teaching experience, and a permanent teaching or administrative license are required.

For the Doctor's Degree.—A Master's degree from an accredited college, or the equivalent, and the approval of the Faculty of the School of Education are required.

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS

THE DEGREES

The School of Government, Business, and International Affairs offers work leading to the following degrees: (1) Bachelor of Arts in Government with a major in International Affairs or Public Affairs; (2) Bachelor of Business Administration with a major in Accounting, Business Administration, or Business and Economic Statistics; (3) Master of Arts in Government with a major field in International Affairs, Public Affairs, Public Administration, Personnel Administration, or Economic Policy; (4) Master of Business Administration with a major field in Accounting, Business and Economic Statistics, General Business Administration, Hospital Administration, or Personnel Administration; and (5) Doctor of Business Administration.

The Master's degrees are based on a comprehensive examination and thesis. The minimum Master's program is 30 semester hours of which 6 represent the thesis. Applicants whose undergraduate training does not include background courses necessary before taking the comprehensive examination must undertake programs longer than the 30-hour minimum.

ENTRANCE REQUIREMENTS

For the Bachelor's Degrees

Bachelor of Arts in Government.—An Associate in Arts degree based on the *International Affairs* or *Public Affairs* curriculum in the Junior College, or the equivalent, is required.

Bachelor of Business Administration.—An Associate in Arts degree based on the *Accounting, Business Administration, or Business and Economic Statistics* curriculum in the Junior College, or the equivalent, is required.

For the Master's Degrees

A Bachelor's degree from an accredited college or university is required. A student from an unaccredited institution may be admitted at the discretion of the

Committee on Admission and Advanced Standing, but may be required to take work above the minimum requirements.

Students admitted to candidacy must have attained a quality-point index of 3.00 (a *B* average) in the undergraduate major.

International Affairs or Public Affairs.—The applicant's undergraduate program must have included background courses corresponding to an undergraduate major at this University.

Public Administration.—An undergraduate major in a social science or equivalent work experience is required.

Accounting or Business and Economic Statistics.—The applicant's undergraduate program must have included background courses corresponding to an undergraduate major at this University.

Economic Policy.—An undergraduate major in Economics at this University, or the equivalent, is required.

Personnel Administration.—An undergraduate major in a social science or education, with appropriate courses in psychology, is required.

Business Administration.—(1) In general business administration: a Bachelor of Business Administration degree at this University, or the equivalent, is required. Applicants who are deficient in such course work may be admitted and will be required to make up deficiencies over and above the normal Master of Business Administration program. (2) In the field of Hospital Administration: a Bachelor's degree from an accredited college or university is required. While a 3.00 average in the undergraduate major is expected, in the selection of candidates consideration will be given to personal qualifications, aptitude for hospital administration, and practical experience.

For the Doctor's Degree

Doctor of Business Administration.—A Master's degree in Business Administration or a related field, or the equivalent, and proficiency in statistics and accounting to the satisfaction of the Committee on Doctoral Studies are required.

THE COLLEGE OF GENERAL STUDIES

The College of General Studies supplements the adult education program of the University through its Campus Division, Off-Campus Division, and Division of Community Services. Programs leading to the following degrees are offered for mature students whose background and experience entitle them to registration in a college designed to meet individual needs: Associate in Arts; Associate in Science; Associate in Secretarial Administration; Bachelor of Arts; Bachelor of Science in Cartography; Master of Arts in the fields of Controllorship, Governmental Administration, and Personnel Management; Master of Arts in International Affairs; and Master of Business Administration.

ENTRANCE REQUIREMENTS

Off-Campus Credit Courses.—A simplified procedure for admission and registration in off-campus courses is conducted at the first meeting of the class. Transcripts of previous academic work are not required. Registration is restricted to those whose qualifications would indicate that they are able to carry the course successfully. Admission to an off-campus course does not constitute admission to degree candidacy in the University.

Noncredit Courses.—In general, noncredit courses will be open to any individual interested in enrolling. When a noncredit course is organized at the request of some particular agency or group, admission may be restricted to the students recommended by the sponsoring organization. A limit on the size of classes may have to be imposed in order to maintain the quality of instruction.

The separate catalogue of the College of General Studies, available at the College, 706 Twentieth Street NW., Washington 6, D. C., contains full information concerning programs, courses, entrance and degree requirements, and fees.

THE DIVISION OF UNIVERSITY STUDENTS

The Division of University Students makes the work of the University, in its several colleges and schools, accessible to three types of students who are not working toward a degree in this University (see page 11).

THE DIVISION OF SPECIAL STUDENTS

This is a nondegree-granting division of the University in which students are enrolled to make up entrance deficiencies to degree-granting colleges and schools of the University.

COURSES OF INSTRUCTION

EXPLANATION OF COURSE NUMBERS

First-group courses.—Courses numbered from 1 to 100 are planned for the student in the freshman or sophomore year. With the approval of the adviser and the dean, they may also be taken by a junior or senior. In certain instances, they may be taken by a graduate student to make up undergraduate deficiencies or as prerequisites to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for the student in the junior or senior year. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the officer of instruction, and when the completion of additional work has been certified by the officer of instruction.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for the graduate student. They are open, with the approval of the officer of instruction, to the qualified senior; they are not open to the Junior College student.

In the Law School, first-year courses are numbered from 100 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and graduate courses, from 401 to 500.

INDICATION OF THE AMOUNT OF CREDIT

The number of hours of credit given for the satisfactory completion of a course is in most cases indicated in parentheses after the name of the course.

The Schedule of Classes for the Summer Sessions, which will be available in April at the Office of the Registrar, will contain information about room assignments and instructors for courses.

The University reserves the right to change or withdraw any of the courses of instruction listed.

ACCOUNTING

1 *Introductory Accounting* (3)

Basic principles underlying accounting records used by single proprietorships and partnerships; preparation of the work sheet and financial statements. MTWThF 8:10-9:00 A.M.

1-2 *Introductory Accounting* (3-3)

First half: basic principles underlying accounting records used by single proprietorships and partnerships; preparation of the work sheet and financial statements. *Second half:* basic principles underlying accounting records used by corporations; introduction to valuation and amortization problems, cost accounting, and analysis and interpretation of financial statements. Prerequisite to Accounting 2: Accounting 1 or permission of the instructor. Accounting 2 begins July 17. MTWThF 7:10-9:00 P.M.

101 *Cost Accounting* (3)

Theory and purposes of industrial cost accounting, treatment of systems of cost control and determination, analysis and interpretation of cost data. Emphasis will be on job order cost accounting. Prerequisite: Accounting 1-2. MTTh 5:35-7:00 P.M.

111 Financial Statement Analysis (3)

Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors; influence of price level changes on accounting data; determination and interpretation of trends and ratios. Prerequisite: Accounting 1-2 or permission of the instructor. MTWTh 7:00-8:05 A.M.

115 Survey of Accounting (3)

Accounting systems used by single proprietorships and corporations with emphasis on methods of compiling, analyzing, classifying, and summarizing accounting data. Valuation, amortization, and income determination problems. Not open for credit to Accounting or Business Administration majors. M 6:10-8:40 P.M.

132 Accounting Theory (3)

Development of basic accounting principles and concepts with special reference to the current thought expressed by the American Institute of Certified Public Accountants and the American Accounting Association. Prerequisite: 6 hours of Accounting. MW 7:10-9:25 P.M.

191 Advanced Accounting (3)

Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Accounting 121-22. MTTh 5:35-7:00 P.M.

193 Business Budgeting (3)

Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial and industrial organizations. Prerequisite: Accounting 1-2. MTTh 11:10 A.M.-12:25 P.M.

212 Managerial Accounting (3)

A survey of internal accounting controls, commercial budgets, and cost accounting systems used by management in directing and controlling a business. Prerequisite: Accounting 211 or permission of the instructor. TTh 7:10-9:25 P.M.

299-300 Thesis (3-3)**COURSE OFFERED IN SPECIAL PROGRAM**

In addition to the regular courses announced above, the University offers the following accounting course for students enrolled in special program.

3 General Accounting (3)

For students in the Navy Graduate Comptrollership program only. Study of accounting systems used by single proprietorships and corporations, with emphasis on accounting theory, terminology, and the analysis and interpretation of accounting data.

ART**ART HISTORY AND THEORY****1 Art Appreciation (3)**

A consideration of the vocabulary, methods, and materials of creative expression in the fine arts. A study of the language and function of art in its various media, the development of styles, aesthetic principles, theories, and ideals in art through the ages. (Not intended for the prospective Art major.) MTWThF 6:10-7:00 P.M.

72 Introduction to the Arts in America (3)

Painting, sculpture, architecture, and the popular arts during the 19th and 20th centuries. MTWTh 3:10-4:15 P.M.

105 Renaissance Art in Italy (3)

The development of painting, sculpture, and architecture in 15th and 16th century Italy. MTWThF 5:10-6:00 P.M.

110 Contemporary Art (3)

A study of sculpture and painting from Post Impressionism through the later modern movements to the present. MTWTh 1:10-2:15 P.M.

204 Art of the Far East* (3)

The architecture, painting, and sculpture of China, Korea, and Japan. MTWTh 11:10 A.M.-12:15 P.M.

246 Seminar: Classical Art (3)

MW 7:10-9:15 P.M.

289-90 Thesis (3-3)**DRAWING AND PAINTING†****21 Basic Design ‡ (3)**

Practice of the basic principles of design; creative exercise in various media to acquire the control of two- and three-dimensional form. MTWThF 9:00-12:00 A.M.

65 Drawing and Painting I (3)

MTWThF 9:00-12:00 A.M.

135 Applied Design (3)

Principles of design applied to advertising, layout, and television graphic arts. MTWThF 1:00-4:00 P.M.

165 Drawing and Painting II ‡ (3)

MTWThF 1:00-4:00 P.M.

175 Advanced Design (3)

MTWThF 9:00-12:00 A.M.

265 Painting III ‡ (3)

MTWThF 1:00-4:00 P.M.

299-300 Thesis (3-3)**BIOLOGY****1-2 Survey in Biology (3-3)**

Systematic study of the plant and animal kingdoms, with emphasis upon the interdependence of living things and their relations with their environments. Introduction to organic evolution, heredity, public health, and conservation. Material fee, \$7 for each half. Nine-week term. Biology 1 is not prerequisite to Biology 2. Biology 2 begins July 20 and ends August 21. Lectures, laboratories, and field trips—MTWThF 1:10-5:00 P.M.

211-12 Research in Cytology (arr.)

Individual problems for advanced students interested in this field. Hours and credits to be arranged.

299-300 Thesis (3-3)**BOTANY****1 General Botany (3)**

Study of the structure, activities, and development of the flowering plant; survey of the different kinds of plants, their evolution, ecological relationships, economic significance, and principles of inheritance. Material fee, \$7. Lecture and laboratory—TTh 9:10-12:00 A.M.; F 9:10-10:00 A.M.

2 General Botany (3)

Continuation of Botany 1. May be taken concurrently with Botany 1. Material fee, \$7. Lecture and laboratory—MW 9:10-12 A.M.; F 10:10-11:00 A.M.

* May be taken for undergraduate credit with the approval of the instructor.

† Art 21-22 is prerequisite to all other studio courses.

‡ May be taken for 6 credit hours with the approval of the instructor.

105 Field Botany (3)

A course, primarily for nonspecialists, emphasizing local flora. Prerequisite: Botany 1 or Biology 1, or permission of the instructor. Lecture and laboratory—TTh 6:10–8:00 P.M.; field trip—to be arranged.

295 Research (arr.)

Hours, credits, and fees to be arranged.

299–300 Thesis (3–3)**BUSINESS AND PUBLIC ADMINISTRATION****BUSINESS ADMINISTRATION****101 Business Organization and Combination (3)**

Simple and interrelated forms of business enterprise and their control by government. Th 2:10–4:40 P.M.

102 Fundamentals of Management (3)

Planning, organizing, directing, coordinating, and controlling the activities of the administrative unit; evolution of management thinking. MW 2:10–4:40 P.M.

105 Personnel Management (3)

Industrial personnel and manpower programs, organization and policy in personnel activities. MW 5:30–8:00 P.M.

138 Investments (3)

Analysis of factors of investment credit with application to different types of investments, proper selection of investments for various classes of investors, regulation. Prerequisite: Accounting 1–2. TTh 5:30–8:00 P.M.

141 Principles of Marketing (3)

An introduction to marketing structure and its relation to the total economy, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies. Prerequisite: Economics 1–2. TTh 5:30–8:00 P.M.

161 Commercial Law: Contracts, Sales, Agency, and Bailments (3)

MW 12:45–3:00 P.M.

201 Advanced Management (3)

An advanced course in management emphasizing principles of management in relation to business enterprise. MW 6:10–8:00 P.M.

232 Seminar in Business Finance (3)

Research in advanced financial problems. TTh 6:10–8:00 P.M.

292 Seminar in Business Management (3)

Research on various phases of management as practiced in American industry. MW 8:10–10:00 P.M.

299–300 Thesis (3–3)

Hours to be arranged.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following business administration courses for students enrolled in special programs.

107 Labor-Management Contracts (3)

For students in the Air Force Advanced Management program only. Management's role in the negotiation and administration of collective bargaining agreements, as essential to development of good labor-management relations. Hours to be arranged.

268 Management Engineering (3)

For students in the Air Force Advanced Management program only. Analysis of the techniques for initiation and implementation of management engineering programs.

with emphasis on organization and methods surveys, including the study of work measurement, work simplification, management audits, and other management improvement programs.

269 Readings and Conferences in Controllershship (3)

For students in the Navy Graduate Comptrollership program only.

275 Human Relations in Business (3)

For students in the Navy Graduate Comptrollership program only.

PUBLIC ADMINISTRATION

210 The Management Function (3)

Principles and processes of management with particular attention to planning of organization, direction and coordination of work, internal communication, and measurement of achievement in government. MW 6:10-8:00 P.M.

211 Problems of Governmental Organization (3)

Theories and principles of organization; analysis of problem areas in administration, such as decentralization, staff-line, field-headquarters, and executive-legislative relationships. MW 8:10-10:00 P.M.

232 Personnel Procedures and Problems (3)

Study of such personnel functions as recruitment, selection, placement, promotion, supervision, evaluation, classification, and training. Practical problems of personnel administration. TTh 6:10-8:00 P.M.

297 Seminar in Public Administration (3)

Advanced research on various phases of public administration including methods of policy formulation and control, the application of systems to management, administration problems of bureaucratic relationships. TTh 8:10-10:00 P.M.

299-300 Thesis (3-3)

Hours to be arranged.

COURSE OFFERED IN SPECIAL PROGRAM

In addition to the regular courses announced above, the University offers the following public administration course for students enrolled in the Air Force Advanced Management Program.

251 Governmental Budgeting (3)

The role of budgeting in management; the principles and practices of budgetary formulation and administration.

CHEMISTRY

11-12 General Chemistry * (4-4)

Elementary course in general chemistry. Prerequisite: one year of high school algebra. Students with credit for one semester of general chemistry (college level) may enter Chemistry 12 on July 20. Laboratory fee, \$18 for each half. Nine-week term ending August 21. MTWThF 8:30 A.M.-1:20 P.M.

21 Qualitative Inorganic Analysis (4)

Theoretical and practical study of methods of separating and identifying the more common cations and anions using semi-micro techniques. Prerequisite: Chemistry 12. Laboratory fee, \$18. Eight-week term. TWThF 1:10-5:00 P.M.

22 Quantitative Inorganic Analysis I (4)

Theory and practice of quantitative analysis by typical volumetric and gravimetric procedures. Prerequisite: Chemistry 21. Laboratory fee, \$18. Eight-week term. TWThF 1:10-5:00 P.M.

* Full-year course; credit is not given until the second half of course is completed.

151-52 Organic Chemistry * (4-4)

Chemistry of the compounds of carbon. Prerequisite†: Chemistry 21. Chemistry 151 laboratory fee, \$11; Chemistry 152 laboratory fee, \$18. Students who have credit for Chemistry 151 may enter Chemistry 152 on July 20. Nine-week term ending August 21. MTWThF 8:30 A.M.-1:20 P.M.

295-96 Research (arr.)

Research on problems approved by the Staff. Open to qualified students with advanced training. Laboratory fee, \$7.50 a semester hour. Hours and credits to be arranged.

299-300 Thesis (3-3)

Laboratory fee, \$18 each half. Hours to be arranged.

ECONOMICS ‡**1 Principles of Economics ‡ (3)**

Survey of the major economic principles, institutions, and problems in contemporary life. MTWThF 9:10-10:00 A.M. or MTWTh 5:55-7:00 P.M.

2 Principles of Economics (3)

Continuation of Economics 1. Prerequisite: Economics 1. MTWTh 11:10 A.M.-12:15 P.M. or MTWTh 7:10-8:15 P.M.

101 Economic Analysis (3)

Analysis of demand, supply, and commodity pricing; theory of national income determination; pricing of productive services; welfare economics. MTWTh 7:55-9:00 A.M.

121 Money and Banking (3)

Theory of money, credit, and banking; commercial banking and the Federal Reserve System; other financial institutions; international aspects of money; current financial problems. MTWTh 12:25-1:30 P.M.

181 International Economics (3)

Survey of world economics, theories of international trade, analysis of international economic problems, and the international organizations. MTWTh 5:55-7:00 P.M.

213 Economic Thought in the Twentieth Century (3)

Continuation of Economics 201-2. The principal trends in economic thought during the present century. TTh 6:10-8 P.M.

219 Managerial Economics (3)

Analysis of price, production, and inventory policies of business firms. MW 6:10-8:00 P.M.

251 Theories of Economic Development (3)

Growth and change in economic activity, capital accumulation, innovations in technology and business organization. TTh 8:10-10:00 P.M.

299-300 Thesis (3-3)**COURSE OFFERED IN SPECIAL PROGRAM**

In addition to the regular courses announced above, the University offers the following economics course for students enrolled in the Navy Graduate Comptrollership program.

195 Governmental and Industrial Economics (3)

Survey of national income, the financial system, international economics, and public economic policy.

* Full-year course; credit is not given until the second half of course is completed.

† This prerequisite may be waived in the case of the student who has earned a grade of C or better in Chemistry 12 within the past two years.

‡ Economics 1-2 is prerequisite to all other courses in Economics.

EDUCATION

TWELVE-WEEK SESSION—JUNE 12 TO SEPTEMBER 1

FOUR THREE-WEEK WORKSHOP COURSES—DAY

109A Human Development, Learning, and Teaching * (3)

For the general student as well as the prospective teacher. Nature of human growth, development, and learning, illustrated by observation of children in learning situations. June 12 to 30: MTWThF lecture and conference—morning; small group discussions and field work—afternoon.

110A Human Development, Learning, and Teaching * (3)

For the general student as well as the prospective teacher. Nature of teaching based upon principles of human growth, development, and learning, illustrated by observation of school situations. July 3 to 21: MTWThF lecture and conference—morning; small group discussions and field work—afternoon.

121A Society and the School * # (3)

For the general student as well as the prospective teacher. The historical and sociological development of education at local, national, and international levels; cooperation of the school with other community agencies. July 24 to August 11: MTWThF lecture and conference—morning; small group discussions and field work—afternoon.

122A Society and the School * # (3)

For the general student as well as the prospective teacher. Organization and operation of schools; principles and functions; role of the teacher. August 14 to September 1: MTWThF lecture and conference—morning; small group discussions and field work—afternoon.

FOUR SIX-WEEK COURSES—EVENING

109B Human Development, Learning, and Teaching || (3)

For the general student as well as the prospective teacher. Nature of human growth, development, and learning, illustrated by observation of children in learning situations. Field work to be arranged. June 12 to July 21: lecture—MW 6:40–9:00 P.M.; conference—6:00–6:40 P.M. (days to be arranged).

110B Human Development, Learning, and Teaching || (3)

For the general student as well as the prospective teacher. Nature of teaching based upon principles of human growth, development, and learning, illustrated by observation of school situations. Field work to be arranged. July 24 to September 1: lecture—MW 6:40–9:00 P.M.; conference—6:00–6:40 P.M. (days to be arranged).

121B Society and the School || # (3)

For the general student as well as the prospective teacher. The historical and sociological development of education at local, national, and international levels; cooperation of the school with other community agencies. Field work to be arranged. June 12 to July 21: lecture—MW 6:40–9:00 P.M.; conference—6:00–6:40 P.M. (days to be arranged).

122B Society and the School || (3)

For the general student as well as the prospective teacher. Organization and operation of schools; principles and functions; role of the teacher. Field work to be arranged. July 24 to September 1: lecture—MW 6:40–9:00 P.M.; conference—6:00–6:40 P.M. (days to be arranged).

* A workshop course requiring the full daytime attention of enrollees. Concurrent registration for another course scheduled in morning or afternoon not permitted.

† This course may not be taken by students who have completed or plan to enroll in Education 111.

‡ Prerequisite: adequate professional preparation.

§ This course may not be taken by students who have completed or plan to enroll in Education 121.

¶ Enrollees fully employed may not register for another course.

This course may not be taken by students who have completed or plan to enroll in Education 245.

NINE-WEEK SESSION—JUNE 19 TO AUGUST 18

FIRST BLOCK—JUNE 19 TO JULY 7

112 *Guidance in Elementary Schools* * (3)

Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Education 109-10 and 121-22. June 19 to 23: lecture—late afternoon; small group discussions and field work—evening. June 26 to July 7: lecture and conference—morning; small group discussions and field work—afternoon.

117 *Elementary School Science* * † (3)

For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience. June 19 to 23: lecture—late afternoon; small group discussions and field work—evening. June 26 to July 7: lecture and conference—morning; small group discussions and field work—afternoon.

219 *Elementary School Classroom Procedures* * ‡ (3)

Current classroom practices with particular emphasis on ways of planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences. June 19 to 23: lecture—late afternoon; small group discussions and field work—evening. June 26 to July 7: lecture and conference—morning; small group discussions and field work—afternoon.

245 *School and Community* * † § (3)

The school as an important member of a team of social agencies that builds the community. June 19 to 23: lecture—late afternoon; small group discussions and field work—evening. June 26 to July 7: lecture and conference—morning; small group discussions and field work—afternoon.

251 *Guidance in Secondary Schools* † (3)

Scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program. June 19 to 23: lecture and conference—late afternoon; small group discussions and field work—evening. June 26 to July 7: lecture and conference—morning; small group discussions and field work—afternoon.

255 *Secondary Education* * # (3)

Current proposals for the improvement of secondary education. June 19 to 23: lecture and conference—late afternoon; small group discussions and field work—evening. June 26 to July 7: lecture and conference—morning; small group discussions and field work—afternoon.

295A *Educational Research Methods and Procedures* * (3)

Required of all Master of Arts candidates following Plan 2. Knowledge of elementary statistics required. June 19 to 23: lecture and conference—late afternoon; small group discussions and field work—evening. June 26 to July 7: lecture and conference—morning; small group discussions and field work—afternoon.

SECOND BLOCK—JULY 10 TO JULY 28 **

113 *Elementary School Art* * (3)

For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22. Material fee, \$4.50. Lecture and conference—morning; small group discussions and field work—afternoon.

116 *Elementary School Social Studies* * † (3)

For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience. Lecture and conference—morning; small group discussions and field work—afternoon.

* † ‡ # See footnotes on page 30.

** Psychology 229 Seminar: *Occupational and Educational Information* (see page 42) will be offered July 10 to 28 as a part of the Second Block of the Nine-week Workshop Session.

120 Elementary School Arithmetic * † (3)

For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience. Lecture and conference—morning; small group discussions and field work—afternoon.

207 Curriculum Materials * † (3)

For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations. Lecture and conference—morning; small group discussions and field work—afternoon.

243 Human Relations in the Classroom * † (3)

Principles and practices involved in interpersonal relationships between learner and teacher and among learners. Lecture and conference—morning; small group discussions and field work—afternoon.

256 Secondary Education * † (3)

Current problems in each of the subject-matter fields. Lecture and conference—morning; small group discussions and field work—afternoon.

THIRD BLOCK—JULY 31 TO AUGUST 18****114 Elementary School Music * (3)**

For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22. Lecture and conference—morning; laboratory and field work—afternoon.

115 Teaching of Reading in the Elementary School * † (3)

A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 109-10 and 121-22 or teaching experience. Lecture and conference—morning; small group discussions and field work—afternoon.

128 Children's Literature * † (3)

For teachers. Exploring and evaluating the newer books for children and the children's classics, understanding the contribution of literature in child development, appreciating children's original expressions. Prerequisite: Psychology 1 and 22. Lecture and conference—morning; small group discussions and field work—afternoon.

225 Elementary School Reading * † (3)

Developmental and remedial approaches to reading problems. Demonstrations of diagnostic and corrective techniques used by the classroom teacher and the reading specialist or supervisor. Lecture and conference—morning; small group discussions and field work—afternoon.

231 Secondary School Classroom Procedures * † (3)

Survey of current classroom practices with particular attention to selected topics such as teacher-pupil planning, group procedures, pupil security, initiatory and culminating activities, individual and group evaluation techniques; teaching aids, etc.; review of recent literature. Lecture and conference—morning; small group discussions and field work—afternoon.

241 Education of the Gifted * † (3)

For the classroom teacher. Nature and discovery of giftedness; provisions for the gifted in regular classes; experimental projects. Lecture and conference—morning; small group discussions and field work—afternoon.

* †, ‡ See footnotes on page 30

** Psychology 236 Seminar: *Analysis of the Individual for Purposes of Counseling* (see page 43) will be offered July 31 to August 18 as a part of the Third Block of the Nine-week Workshop Session.

SIX-WEEK SESSION—JULY 10 TO AUGUST 18

- 216 *Education of Slow-learning Children* ‡ (3)
Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties. MTWThF 2:10-3:10 P.M.; two conference hours to be arranged.
- 217 *Philosophy of Education* ‡ (3)
Designed to help students formulate a personal philosophy of education. MTWThF 8:00-9:00 P.M.; two conference hours to be arranged.
- 229 *Administration of Elementary Education* ‡ (3)
For experienced teachers and administrators. Administration as a means of achieving instructional objectives, organizing learning and teaching activities, handling supplies and equipment, maintaining the building, and integrating school and community life. Emphasis upon guide lines to action. MTWThF 1:00-2:00 P.M.; two conference hours to be arranged.
- 233 *Audio-visual Education* ‡ || (3)
Role of audio-visual materials in learning; selection, evaluation, and use of materials; administrative problems in the care, operation, maintenance, and use of audio-visual materials and equipment. Material fee, \$7. MW 6:40-9:00 P.M.; two conference hours to be arranged.
- 272 *The Teacher and School Supervision* ‡ (3)
Nature, organization, human relationships, and techniques. MTWThF 10:20-11:20 A.M.; two conference hours to be arranged.
- 276 *Seminar: Public Relations in School Administration* ‡ || (3)
Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making. TTh 6:40-9:00 P.M.; two conference hours to be arranged.
- 279 *Adult Education* ‡ (3)
Current concepts and objectives, agencies involved, programs on all levels—international through community. TTh 6:40-9:00 P.M.; two conference hours to be arranged.
- 281 *Group Procedures in Education* * (3)
Theory, practice, evaluation, and application to all educational levels. MTWThF 2:10-3:10 P.M.; two conference hours to be arranged.
- 295B *Educational Research Methods and Procedures* (3)
Required of all Master of Arts candidates following Plan 2. Knowledge of elementary statistics required. MTWThF 9:10-10:10 P.M.; two conference hours to be arranged.
- 297 *Reading in Education*
To assist those preparing for the comprehensive examinations. No credit toward degree requirements. MTWThF 4:45-5:45 P.M. Tuition fee, \$24.

ENGLISH ‡

ENGLISH COMPOSITION

- A *English for Foreign Students* (3)
A course in reading and writing designed to assist the foreign student in overcoming deficiencies in the use of English. Special attention is given to spelling, syntax, grammar, idiom, and vocabulary. MTWTh 5:55-7:00 P.M.
- 1 *English Composition* ‡ (3)
Review of grammar, exercises in composition, readings. MTWThF 9:10-10:00 A.M. or MTWThF 6:10-7:00 P.M.
- IX *English Composition* ‡ (3)
An intensive course in English grammar and composition to which are assigned students whose placement tests show them inadequately prepared for the regular work of

* ‡, || See footnotes on page 30. † See footnote page 34.

English 1. The course begins with detailed instruction, drill, and exercises in the basic structure of the English language and in the writing of paragraphs; it continues with the content of English 1. English 1X meets for a period of a half five times a week and carries 3 semester hours of credit. The tuition fee is \$97 (the regular fee of \$24 a semester hour, plus an additional fee of \$25). MTWThF 7:10-8:40 P.M.

2 English Composition † (3)

For second-semester freshmen not following the pre-Columbian College curricula. Readings and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X. MTWThF 10:10-11:00 A.M. or MTWThF 7:10-8:00 P.M.

4 English Composition † (3)

The second half of the six-hour English Composition course required of students in the pre-Columbian College curricula. A course in critical analysis and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X and both semesters of one of the introductory literature courses. MTWThF 11:10-12:00 A.M.

11 The Writing of Reports (3)

Theory and practice in the writing of technical reports. Prerequisite: English 1 or 1X and 2 or 4. MTWTh 5:55-7:00 P.M.

ENGLISH LITERATURE ‡

51 Introduction to English Literature (3)

A historical survey. From beginnings to 1800. MTWThF 10:10-11:00 A.M. or MTWTh 5:55-7:00 P.M.

52 Introduction to English Literature (3)

A historical survey. Literature since 1800. MTWTh 7:10-8:15 P.M.

136 Shakespeare (3)

The tragedies. MTWTh 7:10-8:15 P.M.

162 Victorian Literature (3)

Poetry from 1830 to 1900. MTWTh 5:55-7:00 P.M.

165 The Twentieth Century (3)

British poetry and criticism since 1900. MTWTh 1:10-2:15 P.M.

184 The English Drama (3)

A historical survey from 1660 to the present day. MTWTh 8:55-10:00 A.M.

295 Studies in the History of English Literary Criticism (3)

Literary criticism from Plato to Dryden. Open to undergraduates with the approval of the instructor. TTh 8:00-10:00 P.M.

AMERICAN LITERATURE *

71 Introduction to American Literature (3)

A historical survey. From beginnings to 1860. MTWTh 1:10-2:15 P.M. or MTWTh 7:10-8:15 P.M.

* English 51-52, 71-72, 91-92, Classical Languages 71-72, French 51-52, German 51-52, Slavic Languages 91-92, or Spanish 51-52 is prerequisite to all second-group courses except English 171-72.

† Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared are assigned to English 1X.

‡ All pre-Columbian College students (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1 or 1X, both semesters of one of the introductory literature courses, and English 4.

English 1 or 1X is prerequisite to all other courses in English. English 2 is the second half of the six-hour composition course requirement of students not required to follow the pre-Columbian College sequence.

§ English 51-52, 71-72, 91-92, Classical Languages 71-72, French 51-52, German 51-52, Slavic Languages 91-92, or Spanish 51-52 is prerequisite to all second-group courses except English 125.

- 72 *Introduction to American Literature* (3)
A historical survey. Literature since 1860. MTWTh 11:10 A.M.-12:15 P.M.
- 170 *The American Short Story* (3)
The historical development of the short story in America. MTWTh 7:10-8:15 P.M.
- 174 *Major American Poets* (3)
The 20th century. MTWTh 5:55-7:00 P.M.
- 176 *American Drama* (3)
Critical study of 20th century drama. MTWTh 11:10 A.M.-12:15 P.M.

GEOGRAPHY

- 51 *Introduction to Geography* (3)
A study of place attributes and characteristics; patterns and associations of physical and cultural earth features. MTWThF 10:10-11:00 A.M.
- 52 *World Regions* (3)
The analysis of world regional divisions, description and interpretation of region complexes, evaluation of regional differences as they affect the distribution and activities of man. MTWThF 9:10-10:00 A.M.
- 143 *Designs for Tomorrow's Cities* (3)
Theories of city functions and structures, analysis of contemporary urban problems, development of optimum designs for future cities. MTWThF 6:10-7:00 P.M.
- 172 *Field Studies in Physical and Social Geography* (3)
A series of field trips designed to demonstrate geographic field techniques and afford a representative cross-section of field study opportunities in the Washington, D. C. area. Transportation fee, \$20. Hours to be arranged.

GERMANIC LANGUAGES AND LITERATURES *

- 1-2 *First-year German* (3-3)
Full-year course: credit is not given for German 1 until German 2 is completed. The essentials of German grammar, translation of easy prose. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 each half.† Second half begins July 17. Lecture MTWThF 9:10-11:00 A.M. or MTWThF 6:10-8:00 P.M.; workshop—to be arranged.
- 3-4 *Second-year German* (3-3)
Full-year course: credit is not given for German 3 until German 4 is completed. Selections from modern German prose; review of grammar. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 each half.† Prerequisite: German 1-2 or two years of high school German. Second half begins July 17. Lecture MTWThF 9:10-11:00 A.M. or MTWThF 6:10-8:00 P.M.; workshop—to be arranged.
- 47 *Beginning German for Reading Examination Candidates*
This course carries no credit. Tuition fee, \$72 for all students except doctoral candidates. MTWTh 5:55-7:00 P.M.
- 49 *German Readings for Nonmajor Students* (3)
Primarily for students preparing for reading examinations. Undergraduates admitted with permission of the instructor. No academic credit for graduate students. Prerequisite: German 4 or German 47. MTWTh 7:10-8:15 P.M.

* A standardized placement examination administered at registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination assignment is made to the appropriate course, with credit assigned on the usual basis.

† Students registering for German 1-2 or 3-4 must register for one lecture section and one workshop section for each half of the course. Change in workshop section requires a regular drop-add slip from the Department.

HISTORY *

- 39 *The Development of European Civilization* (3)
Primarily for freshmen. The political, social, economic, and cultural history of the Old World from ancient times to 1715. MTWTh 8:00-9:05 A.M.
- 40 *The Development of European Civilization* (3)
Primarily for freshmen. The political, social, economic, and cultural history of the Old World from 1715 to the present. MTWTh 5:55-7:00 P.M.
- 71 *The Development of the Civilization of the United States* (3)
Primarily for sophomores. The political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. MTWThF 10:10-11:00 A.M. or MTWTh 5:55-7:00 P.M.
- 72 *The Development of the Civilization of the United States* (3)
Primarily for sophomores. The political, social, economic, and cultural forces of the United States in their world setting from 1865 to the present. MTWTh 11:10 A.M.-12:15 P.M.
- 130 *Nationalism* (3)
The historical evolution of modern Nationalism. MTWThF 8:00-8:50 A.M.
- 161 *Ancient Americans* (3)
A study of the Maya, Aztec, Inca, and other early civilizations of North and South America. MTWTh 5:55-7:00 P.M.
- 166 *Mexico and the Caribbean since Independence* (3)
A survey of the republics of Mexico, Central America, and the Caribbean islands. MTWTh 7:10-8:15 P.M.
- 171 *Social History of the United States* (3)
Daily life, institutions, intellectual and artistic achievements of the Agrarian Era 1607-1861. MTWThF 10:10-11:00 A.M.
- 173 *Representative Americans* (3)
A biographical approach to national history. Some fifty significant and pivotal personalities in the development of the United States in government, business, science, religion, journalism, the arts, and social reform. MTWThF 9:10-10:00 A.M.
- 182 *Diplomatic History of the United States since 1898* (3)
Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; and the activities of the American secretaries of state and diplomatic agents. MTWTh 7:10-8:15 P.M.
- 190 *History of India* (3)
The civilization of India and her neighbors from the beginnings to independence. MTWTh 1:10-2:15 P.M.
- 291-92 *Seminar* (3-3)
Prerequisite: approval of the Department. Hours to be arranged.
- 299-300 *Thesis* (3-3)
Required of all candidates for the Master's degree specializing in history. Hours to be arranged.

JOURNALISM

- 72 *Journalism in American Society* (3)
Evolution of newspapers and other media in relation to political, social, and economic life; the concept of press freedom; problems of contemporary journalism. MTWThF 9:10-10:00 A.M.

* History 39-40 is prerequisite to courses 109 through 152 and 190 through 196; History 71-72, to courses 171 through 184; either History 39-40 or 71-72, to courses 161 through 166.

111 *Reporting* (3)

Instruction and classroom practice in gathering, evaluating, and writing news; emphasis on newspapers, other media considered. MTWThF 11:10-12:00 A.M.

115 *Editing and Make-up* (3)

Editing of news and other material for publication, typography and display; use of pictures and other graphic presentations. MTWThF 10:10-11:00 A.M.

121 *Advanced Reporting: Magazine Feature Articles* (3)

Instruction and practice in writing magazine articles, material for which is obtained through independent investigation. MTWThF 11:10-12:00 A.M.

LAW

FIRST SESSION

June 13 to July 27

115 *Contracts I* (4)

Mutual assent, offer and acceptance, consideration, parol evidence rule, Statute of Frauds, third party beneficiaries, assignments, conditions. MTWThF 5:50-7:40 P.M.

202 *Administrative Law* (4)

The position of the administrative process in the separation of powers, including the status of administrative personnel, administrative hearings, judicial scrutiny of administrative action, discretion, and rule-making—particularly as relating to federal administrative agencies. MTWThF 5:50-7:40 P.M.

210 *Business Associations* (4)

Contrast of the partnership and corporation as alternative forms of organization; organizing partnerships and corporations—formalities, capital contributions, share structure; problems of operation; relations between partners; roles of shareholders, directors, officers; control devices; distributions to owners; voluntary reorganization; dissolution and termination. MTWThF 8:10-10:00 A.M.

215 *Civil Procedure* (4)

Pleadings, discovery, joinder, forms of trial and related proof problems. Emphasis is on Federal Rules of Civil Procedure and other modern codes. MTWThF 9:10-11:00 A.M. or MTWThF 5:50-7:40 P.M.

238 *Equity* (2)

A correlation of aspects of equity considered in earlier courses, and inquiring into the nature of equity jurisprudence through analysis of selected problems in equity: historical development of equity, including problems of merger of law and equity; use of equity jurisdiction offensively and defensively, including multi-party actions, injunction of executive and legal actions, and equitable abstention; emphasis on the fashioning of equitable remedies. MTWThF 10:10-11:00 A.M.

251 *Insurance* (2)

The insurance device in life, property, and other risks. MTWThF 12:10-1:00 P.M.

295 *Unfair Trade Practices* (4)

Unfair trade practices at common law and under statutes; trade-marks, trade names; copyright law; misappropriation of ideas; protection of competitors and consumers against false advertising under Federal Trade Commission Act; resale price maintenance under state Fair Trade Acts; miscellaneous business practices. MTWThF 5:50-7:40 P.M.

309 *Conflict of Laws* (4)

Legal problems arising from occurrences transcending state or national boundaries: jurisdiction; foreign judgments; constitutional influences; theoretical bases of choice of law principles and their application to specific fields, including torts, contracts, property, family law, administration of estates, and business associations. MTWThF 9:10-11:00 A.M. or MTWThF 5:50-7:40 P.M.

355 Mortgages (2)

Security interests in real property, their creation, transfer, enforcement, and extinguishment. MT 5:50-8:05 P.M.

380 Suretyship (2)

The law of suretyship, especially in the context of accommodation credit and commercial and financial practices, with attention also to informal and non-consensus suretyship relations and the place of suretyship principles in the solution of legal problems generally. ThF 5:50-8:05 P.M.

SECOND SESSION

July 31 to September 13

116 Contracts II (2)

Scope of protection afforded contracts; specific performance of contracts other than land transactions. TF 5:50-8:05 P.M.

150 Real Property (4)

Historical background of the law of estates and conveyancing; types of estates; dower and curtesy; landlord and tenant relationship; concurrent estates; future interests at common law and after Statute of Uses; Rule against Perpetuities; incidents of divided ownership, as waste; natural rights. MTWThF 5:50-7:40 P.M.

201 Agency (2)

Master and servant (status of agent), respondeat superior, nature of agency relationship, actual authority, parties (disclosed and undisclosed principal), unauthorized transactions, notice, notification. MTh 5:50-8:05 P.M.

219 Commercial Paper (4)

Bills of exchange, promissory notes and checks, especially under the Negotiable Instruments Law. MTWThF 5:50-7:40 P.M.

230 Conveyances (2)

Conveyances, recording; easements, profits, covenants, and equitable servitudes; adverse possession and user. MTWThF 12:10-1:00 P.M.

235 Domestic Relations (2)

Marriage, annulment, and divorce; adoption and custody of children; economic relations. MTWThF 11:10-12:00 A.M.

240 Evidence (4)

Functions of court and jury; qualifications and examination of witnesses; opinion relevancy, and scientific evidence; proof of writing; application of the hearsay rule. MTWThF 9:10-11:00 A.M. or MTWThF 5:50-7:40 P.M.

259 Labor Law (4)

Law governing labor management relations, organization and representation of employees, regulation of economic weapons, enforcement of collective bargaining agreements, interunion and intraunion relations. MTWThF 9:10-11:00 A.M.

279 Taxation—Federal Income (4)

Survey of substantive provisions of federal income tax, including concept of gross income, limitations on allowable deductions, problems of capital gains taxation, non-taxable exchanges of property, basis problems, provisions affecting the taxation of the family, and principles of income tax accounting. MTWThF 5:50-7:40 P.M.

318 Creditors' Rights (4)

Remedies of unsecured creditors; judgments, fraudulent conveyances, creditors' agreements, equity and statutory receiverships, and bankruptcy. The general approach of that of law administration. MTWThF 5:50-7:40 P.M.

376 Restitution (2)

Remedies at law and in equity for restitution of benefits conferred, especially as based on the concept of unjust enrichment. MTWThF 7:30-8:20 A.M.

MATHEMATICS

- 3 College Algebra (3)**
Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry. MTWThF 10:10-11:00 A.M. or MTWTh 5:55-7:00 P.M.
- 6 Plane Trigonometry (3)**
Prerequisite: two years of high school algebra and one year of high school geometry, or Mathematics 3 (or concurrent registration therefor). MTWThF 9:10-10:00 A.M. or MTWTh 7:10-8:15 P.M.
- 12 Analytic Geometry (3)**
Prerequisite: Mathematics 3 and 6, or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry. MTWThF 11:10-12:00 A.M. or MTWTh 5:55-7:00 P.M.
- 29 Calculus I (3)**
Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite or concurrent registration: Mathematics 12. MTWThF 10:10-11:00 A.M. or MTWTh 7:10-8:15 P.M.
- 30 Calculus II (3)**
Differentiation and integration of transcendental functions with applications, methods of integration, vectors and parametric equations. Prerequisite: Mathematics 12 and 29. MTWThF 9:10-10:00 A.M. or MTWTh 5:55-7:00 P.M.
- 31 Calculus III* (3)**
Infinite series, partial differentiation, multiple integrals, solid geometry, improper integrals, and differential equations. Prerequisite: Mathematics 30 (or concurrent registration therefor) or Mathematics 20. MTWThF 10:10-11:00 A.M. or MTWTh 7:10-8:15 P.M.
- 111 Mathematics for Engineers and Physicists I (3)**
Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 30 and 31. MTWThF 11:10-12:00 A.M.
- 112 Mathematics for Engineers and Physicists II (3)**
Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 111 or 132. MTWTh 7:10-8:15 P.M.
- 122 Introduction to Abstract Algebra (3)**
MTWThF 11:10-12:00 A.M.
- 139 Advanced Calculus I (3)**
Limits, continuity, real number system, mean value theorems, partial differentiation, implicit function theorems, transformations, and mappings. MTWTh 7:10-8:15 P.M.
- 295-96 Reading and Research (3-3)**
As arranged.
- 299-300 Thesis (3-3)**
As arranged.

PHARMACY

- 192 Hospital Pharmacy: Prescription Practice (1)**
Prescription practice in the University Hospital Pharmacy. Prerequisite: Pharmacy 102. Laboratory—hours to be arranged.

* Mathematics 31 is prerequisite to all second-group courses.

PHILOSOPHY

51 *Introduction to Philosophy* (3)

A critical examination of some of the problems of modern philosophy in relation to scientific and social developments since the Renaissance. TWTh 7:10-8:35 P.M.

111 *History of Philosophy* (3)

Philosophy in Greek and Roman Times. TWTh 5:35-7:00 P.M.

PHYSICS

11 *Introductory Physics* (3)

An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. This course may be taken as a terminal course by nonscience students who wish an introduction to the physical sciences. Prerequisite: high school algebra and plane geometry. Material fee, \$11. First half of nine-week term—ends July 19. Lecture and laboratory—MWF 1:10-4:30 P.M.; recitation—TTh 1:10-3:00 P.M.

12 *Introductory Physics* (3)

Mechanics, wave-motion, and sound. Prerequisite: Physics 11 (or former Physics 5). Material fee, \$11. Second half of nine-week term—July 20-August 21. Lecture and laboratory—MWF 1:10-4:30 P.M.; recitation—TTh 1:10-3:00 P.M.

14 *General Physics* (3)

Mechanics, wave motion, and sound. Prerequisite: Physics 11. Prerequisite or concurrent registration: Mathematics 29. Material fee, \$11. Lecture—TTh 6:10-7:00 P.M.; recitation and laboratory—MW 6:10-9:30 P.M.

POLITICAL SCIENCE *

9 *Government of the United States* * (3)

The structure, powers, and operation of the Federal Government: Congress, the President, and the Supreme Court; elections, political parties, and pressure groups. MTWThF 11:10-12:00 A.M. or MTWTh 7:10-8:15 P.M.

10 *Government of the United States* * (3)

Analysis of the structure, powers, and operation of state and local government: civil rights, major functions of government at federal, state, and local levels. MTWThF 10:10-11:00 A.M.

104 *State and Local Governments* (3)

State, municipal, and other local governmental forms, operations, and problems, with attention to policy formulation and administration, and to the forces of practical politics. Not open to students who have credit for former Political Science 115. MTWThF 9:10-10:00 A.M.

107 *Problems in Modern Political Thought* (3)

Development of democratic political institutions and analysis of the main challenges to constitutional democracy in the 19th and 20th centuries. MTWTh 5:55-7:00 P.M.

111 *Introduction to Comparative Government* (3)

Government and politics of the principal constitutional democracies of Western Europe: Great Britain and France. MTWThF 10:10-11:00 A.M.

121 *The Constitution of the United States* (3)

The judicial power of the federal courts in constitutional interpretation. Special attention to state-federal relationships, taxation, and legislative-executive-judicial relationships. MTWTh 7:10-8:15 P.M.

* Six hours of first-group Political Science courses are prerequisite to all second-group courses.

- 171 International Politics (3)**
Basic forces underlying the conduct of international relations and the formation of foreign policy: power politics, imperialism, collective security, and international co-operation. MTWTh 5:55-7:00 P.M.
- 172 International Organization: The United Nations (3)**
Development and current operation of international organization within the system of sovereign states with emphasis on the United Nations. MTWThF 11:10-12:00 A.M.
- 181 International Law (3)**
Survey of the public law of nations with particular emphasis on the law of peace. MTWThF 10:10-11:00 A.M.
- 197 Proseminar in Foreign Affairs (3)**
Reading and discussion course for coordination and review. Primarily for seniors in the International Affairs major. TTh 2:10-4:00 P.M.
- 220 Reading Course in Political Theory (3)**
Readings and group discussions, principally on modern political and constitutional theory since the 17th and 18th centuries. TTh 8:10-10:00 P.M.
- 245 The American Political Process: Political Parties and Interest Groups (3)**
Readings and group discussions on the nature and functions of political parties and the role and techniques of political interest groups. MW 8:10-10:00 P.M.
- 277 Seminar: Latin American Government (3)**
Analysis of the political structures of selected Latin American republics. Two comparable governments studied. MW 8:10-10:00 P.M.
- 279 Reading Course in International Affairs (3)**
Reading and discussion of basic materials designed to stimulate investigation of problems in the nature and development of international law, politics, and organization. TTh 8:10-10:00 P.M.
- 299-300 Thesis (3-3)**
Hours to be arranged.

PSYCHOLOGY *

- 1 General Psychology * (3)**
The fundamental principles underlying human behavior. MWTh 8:35-10:00 A.M. or MWTh 5:35-7:00 P.M.
- 4 Psychology of Adjustment (3)**
Processes involved in the total adjustment of the individual, with emphasis on social environment; development in the individual of adjustment techniques. MWTh 7:10-8:35 P.M.
- 22 Introduction to Educational Psychology (3)**
Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training. MWTh 11:10 A.M.-12:35 P.M.
- 98 Abnormal Psychology (3)**
The causes, diagnosis, treatment, and prevention of the various types of maladjustment and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science. MWTh 8:35-10:00 A.M.
- 118 Physiological Psychology (3)**
Structure, function, and phylogeny of receptors, nervous system, and effectors as mediators of behavior, including drives, learning, and emotions. MWTh 11:10 A.M.-12:35 P.M.

* Psychology 1 is prerequisite to all other courses in Psychology. Six credits in courses from 1 to 100 are prerequisite to all courses from 100-200.

129 Introduction to Counseling and Guidance (3)

A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling. MWTh 5:35-7:00 P.M.

131 Psychological Tests (3)

A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, \$7. MWTh 7:10-8:35 P.M.

151 Social Psychology (3)

The social foundations of attitudes and behavior. Individual adjustment to group situations, such as the family, school, fraternity, and occupation. The psychological basis of race prejudice, nationalism, and war. MWTh 7:10-8:35 P.M.

193 Readings in Psychology (3)

Supervised readings on specific topics in psychology, with conferences, for undergraduate majors. Open only to seniors with 18 or more credits in psychology with a quality point index of 3.00 or higher. Permission of staff member under whom course is to be taken is necessary. Hours to be arranged.

196 History and Systems of Psychology (3)

A survey of the contemporary schools of psychology. Prerequisite: 12 credits in psychology. MWTh 5:35-7:00 P.M.

201 Seminar: Advanced General Psychology (3)

General review of the field for graduate students with an intensive study of selected problems. Required in all graduate programs. TTh 7:10-9:00 P.M.

202 Psychological Research Methods and Procedures (3)

Required of all Master's candidates in psychology. Prerequisite: Experimental Psychology and an elementary course in statistics. MW 7:10-9:00 P.M.

207 Readings in Psychology for Graduate Students (3)

Supervised readings with conferences on specified topics in psychology. Permission of staff member under whom course is to be taken is necessary. Hours to be arranged.

244 Seminar: Job Analysis and Evaluation (3)

Techniques for the development of work performed descriptions, qualifications analysis, and job demands specifications. The evaluations and classification of jobs for the purpose of establishing wage structures. MW 7:10-9:00 P.M.

281 Practicum in Counseling (3)

Supervised practical instruction in agencies doing counseling. Prerequisite: graduate work in counseling. Admission by permission of the Executive Officer of the Department. Hours to be arranged.

283 Practicum in Clinical Psychology (3)

Supervised practical instruction in agencies doing clinical psychological work. Prerequisite: Psychology 212 and 233. Admission by permission of the Executive Officer of the Department. Hours to be arranged.

295-96 Research in Psychology (arr.)

Hours and credits to be arranged.

299-300 Thesis (3-3)

Hours to be arranged.

COURSES OFFERED IN NINE-WEEK EDUCATION SESSION

229 Seminar: Occupational and Educational Information * (3)

Designed to acquaint vocational and educational counselors with the basic occupational and educational information necessary in counseling. Sources of data and techniques of collecting, analyzing, and dissemination for purposes of guidance. July 28 to 28. Lecture and conference—morning; small group discussions and field work—afternoon.

* A workshop course requiring the full daytime attention of enrollees. Concurrent registration for other course scheduled in morning or afternoon not permitted.

- 236 *Seminar: Analysis of the Individual for Purposes of Counseling** (3)
A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: an introductory course in educational or psychological measurements. July 31 to August 18. Lecture and conference—morning; small group discussions and field work—afternoon.

COURSE OFFERED IN ENGINEERING ADMINISTRATION PROGRAM

145 *Principles of Human Relations* (3)

A basic course in the psychological principles underlying human relations. TTh 6:10–8:15 P.M.

RELIGION

9 *The Old Testament* (3)

A historical and literary approach to the study of the books of the Old Testament with special consideration given to the development of religious ideas, institutions, and outstanding personalities. TWTh 7:10–8:35 P.M.

10 *The New Testament* (3)

A study of the literature of the New Testament from the standpoint of occasion, purpose, dominant ideas, and permanent values. Special emphasis on the approach, the structure, and the significance of the Gospels and Epistles. MWF 8:35–10 A.M.

59 *History of Religion* (3)

Primitive and ancient national religions; Confucianism, Taoism, Buddhism, Hinduism, and Shintoism—their historical setting, founders, and development of religious thought and culture. MWF 11:10 A.M.–12:35 P.M.

132 *History of Modern Christianity* (3)

The origin and development of Protestantism; the Roman Catholic revival; the status of the Eastern churches; doctrines, worship, expansion, church and state, and relation to modern thought and life. TWTh 5:35–7:00 P.M.

291 *Readings and Research* (3)

Investigation of special problems in the history of religion. Hours to be arranged.

299–300 *Thesis* (3–3)

Hours to be arranged.

ROMANCE LANGUAGES AND LITERATURES †

FRENCH

1–2 *First-year French* (3–3)

Pronunciation, grammar, composition, reading of modern French prose. Aural training, oral practice in electronic language workshop. Full-year course: credit will not be given for French 1 until French 2 is completed. Workshop fee, \$6 for each half. ‡ Second half begins July 17. Lecture—MTWThF 8:10–10:00 A.M. or MTWThF 6:10–8:00 P.M.; workshop—to be arranged.

3–4 *Second-year French* (3–3)

Advanced grammar and composition, reading in modern French prose, introduction to French civilization. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 for each half. ‡ Full-year course: credit will not be given for French 3 until French 4 is completed. Prerequisite: French 1–2 or two years of high school French. Second half begins July 17. Lecture—MTWThF 8:10–10:00 A.M. or MTWThF 6:10–8:00 P.M.; workshop—to be arranged.

* A workshop course requiring the full daytime attention of enrollees. Concurrent registration for another course scheduled in morning or afternoon not permitted.

† A standardized placement examination administered at registration is required of all entering students who wish to continue in college the language begun in high school. Upon completion of the examination assignment is made to the appropriate course, with credit assigned on the usual basis.

‡ Students registering for French 1–2 or 3–4 or Spanish 1–2 or 3–4 must register for one lecture section and one workshop section for each half of the course. Change in workshop section requires a regular drop-add slip from the Department.

9-10 French Conversation and Composition (3-3)

Prerequisite: French 4 or the equivalent and permission of the instructor. Workshop fee, \$4 for each half. Second half begins July 17. MTWThF 8:10-10:00 A.M.

49 French Readings for Nonmajor Students (3)

Primarily for graduate students preparing for reading examinations. Undergraduates admitted only with specific permission of the instructor. No academic credit for graduate students. MTWThF 6:10-7:00 P.M.

130 Contemporary French Literature (3)

Surrealism in poetry and the novel. Lectures, discussions, and reports. MTWThF 6:10-7:00 P.M.

SPANISH

1-2 First-year Spanish (3-3)

Pronunciation, grammar, composition, reading of modern Spanish prose. Aural training, oral practice in electronic language workshop. Full-year course: credit will not be given for Spanish 1 until Spanish 2 is completed. Workshop fee, \$6 for each half. Second half begins July 17. Lecture—MTWThF 8:10-10:00 A.M. or MTWThF 6:10-8:00 P.M.; workshop—to be arranged.

3-4 Second-year Spanish (3-3)

Advanced grammar and composition, reading of modern Spanish prose, introduction to Hispanic civilization. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 for each half.* Full-year course: credit will not be given for Spanish 3 until Spanish 4 is completed. Prerequisite: Spanish 1-2 or two years of high school Spanish. Second half begins July 17. Lecture—MTWThF 8:10-10:00 A.M. or MTWThF 6:10-8:00 P.M.; workshop—to be arranged.

9-10 Spanish Conversation and Composition (3-3)

Prerequisite: Spanish 4 or the equivalent and permission of the instructor. Workshop fee, \$4 for each half. Second half begins July 17. MTWThF 8:10-10:00 A.M.

151 The Spanish American Novel (3)

Development of the novel in Spanish America. Lectures, collateral reading, and critical analysis of texts. MTWThF 7:10-8:00 P.M.

SECRETARIAL STUDIES

12 Intermediate Shorthand and Transcription (3)

Review of the principles of Gregg shorthand. Dictation and transcription on general and specialized business subjects. Minimum dictation speed of 80 words a minute attained. Prerequisite: Secretarial Studies 11 or the equivalent; ability to take dictation at 60 words a minute. Laboratory fee, \$5. MTWTh 5:55-7:00 P.M.

15 Advanced Shorthand, Typewriting, and Transcription (3)

Dictation and transcription involving vocabularies in specific businesses. Minimum dictation speed of 120 words a minute attained. Prerequisite: Secretarial Studies 12 or the equivalent. Laboratory fee, \$5. MTWTh 7:10-8:15 P.M.

SLAVIC LANGUAGES AND LITERATURES

1-2 First-year Russian (3-3)

Beginner's course in fundamentals of grammar and pronunciation, with graded reading, oral drill, and written practice. Full-year course: credit will not be given for Russian 1 until Russian 2 is completed. Workshop fee, \$6 for each half.* Second half begins July 17. Lecture—MTWThF 10:10-12:00 A.M. or MTWThF 6:10-8:00 P.M.; workshop—to be arranged.

* Students registering for Spanish 1-2 or 3-4 or Russian 1-2 must register for one lecture section and one workshop section for each half of the course. Change in workshop section requires a regular add slip from the Department.

SOCIOLOGY AND ANTHROPOLOGY *

1 *Man in Modern Society* (3)

Development of culture and personality, the impact of groups and institutions on man's social behavior. Factors producing social problems; individual, community, national and international disorganization. MTWThF 10:10-11:00 A.M. or MTWThF 6:10-7:00 P.M.

134 *Sociology of Child Development* (3)

Socialization of the child through the home and other social institutions, the changing status of childhood, dependent and handicapped children. MTWThF 11:10-12:00 A.M.

153 *Culture and Personality* (3)

Influences of group membership and cultural conditions on personality; socio-cultural factors in mental health; and the relationship of personality to caste, class, and occupation. MTWThF 7:10-8:00 P.M.

295-96 *Research* (arr.)299-300 *Thesis* (3-3)

SPEECH

A *Speech Clinic*

Individual or group lessons, without academic credit, for such speech difficulties as lisping, cleft palate, articulatory problems, and stuttering. Fee: for individual lesson, \$7; for group lesson, \$4. Hours to be arranged.

B *American Speech for Foreign Students* (3)

Class limited to foreign born students. Instruction in the formation of the sounds of spoken English, with emphasis on rhythm and inflection. The International Phonetic Alphabet is used. Analysis of individual voices through recordings. Recording fee, \$5. MTWTh 5:55-7:00 P.M.

1 *Effective Speaking* (3)

Preparation and delivery of extempore speeches, developing confidence and poise, body and voice control; selecting and organizing material. Recording fee, \$2. MTWThF 9:10-10:00 A.M. or MTWTh 5:55-7:00 P.M.

11 *Voice and Diction* (3)

Developing ease, naturalness, and clarity in the speaking voice. Analysis of individual voices through recordings. Phonetic approach to the study of sounds of English and the standards of speech. Recording fee, \$4. MTWThF 10:10-11:00 A.M. or MTWTh 7:10-8:15 P.M.

32 *Oral Reading* (3)

Reading to others; theory and practice in the problems of interpreting the printed page. Prerequisite: Speech 11. Recording fee, \$2. MTWThF 9:10-10:00 A.M.

111 *Effective Speech Communication* (3)

The tools and principles of effective speech communication, including practice in the organization, delivery, and the evaluation of presentations commonly encountered by professional personnel. Not open to speech majors. Hours to be arranged.

21 *Group Discussion and Conference Leadership* (3)

The process of thinking and problem solving in committees and small groups, and the methods of leading discussions and conferences. Prerequisite: 6 hours of speech or the permission of the instructor. MTWThF 11:10-12:00 A.M.

75 *Speech Correction* (3)

A study of the causes of the disorders of speech with emphasis on methods in diagnosis and treatment of defective speech. Admission by permission of the instructor. Hours to be arranged.

* Sociology and Anthropology 1 or 51 is a prerequisite to all other courses in Sociology and Anthropology.

177 Clinical Practice in Speech Therapy (1)

Supervised case work in remedial speech—the University Speech Clinic, District Columbia Crippled Children's Society, and Public School system. This course may be repeated for a total of 6 semester hours. Prerequisite: Speech 175 and permission of instructor. Hours to be arranged.

183 Clinical Practice in Hearing Therapy (1)

Supervised case work with persons handicapped with hearing losses—the University Speech Clinic, the Washington Hearing Society, and the Veterans Administration Audiology Clinic. This course may be repeated for a total of 3 semester hours. Prerequisite: Speech 182 and permission of instructor. Hours to be arranged.

295 Research in Speech and Hearing (arr.)**299-300 Thesis (3-3)**

Hours to be arranged.

STATISTICS ***51 Introduction to Business and Economic Statistics * (3)**

Survey of elementary principles and procedures for presenting, analyzing, and interpreting statistical data; consideration of characteristic values; measures of variability; sampling processes, index numbers, time series analysis, and simple correlation. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9. Lecture—TTh 8:20-10:00 A.M.; laboratory—MW 8:20-10:00 A.M.

53 Introduction to Statistics in Psychology and Education * (3)

Sources of data, tabulation, charts and graphs, averages, dispersion, quartiles and percentiles, raw scores and derived scores, frequency distributions, reliability and validity of tests, normal curve, correlation, elementary sampling, and an introduction to estimation and tests of hypotheses. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9. Lecture—MW 8:20-10:00 A.M.; laboratory: section M—MW 11:10 A.M.-12:50 P.M., section N—TTh 1:10-2:50 P.M.

91 Principles of Statistical Methods * (3)

Variates and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9. Lecture—MW 8:20-10:00 A.M.; laboratory—TTh 8:20-10:00 A.M.

105 Statistics in Psychology and Education (3)

Advanced study of statistical techniques necessary for an application of statistics to research problems. Analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 53. Laboratory fee, \$9. Lecture—MW 11:10 A.M.-12:50 P.M.; laboratory—MW 1:10-2:50 P.M.

107 Statistics for Engineers (3)

Simple probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, nonparametric tests. Emphasis on engineering applications. Prerequisite: differential and integral calculus. MW 5:30-8:00 P.M.

117 Analysis of Variance I (3)

The analysis of variance to segregate factors producing significant variation; a method to estimate experimental error, multiple classifications, Latin Square, Greco-Latin Square, factorials; an introduction to model theory. Applications are stressed. Prerequisite: Statistics 91. Laboratory fee, \$9. Lecture and laboratory—MW 5:20-8:00 P.M.

155 Introduction to Mathematical Probability (3)

Probability distributions, Bayes' theorem and postulate, Bernoulli's theorem and experimental verification, mathematical expectation, laws of large numbers, limit theorems. Prerequisite: differential and integral calculus. TTh 5:30-8:00 P.M.

* Of first-group courses, Statistics 51, 53, and 91 are related in their subject matter, and credit for only one of the three may be applied toward a degree.
Statistics 91 is for Statistics majors, for students in engineering and in the biological and physical sciences.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above the University offers the following courses in statistics for students enrolled in the special programs.

119 *The Bases of Statistical Decision Making* (3)

For students in the Navy Graduate Comptrollership Program only. Introduction to the techniques of decision making, with emphasis on applications rather than theory. Includes: binomial distribution, normal distribution, Type I and II errors, estimation, research methodology, and problems of inference.

120 *Principles of Statistical Analysis* (3)

For students in the Air Force Advanced Management Program only. Introduction to the basic concepts of statistical analysis, measures of central tendency, dispersion, normal distribution, basic statistical inference including estimation and testing hypotheses.

ZOOLOGY

1-2 *Introduction to Zoology* (4-4)

An introduction to the study of the structure, functions, and relation of animals, and of the fundamental biological principles involved. Material fee, \$11 for each half. Nine-week term. Zoology 2 begins July 20 and ends August 21. Lecture and laboratory—MTWThF 6:10-10:00 P.M.

138 *Histology* (3)

An introduction to the microscopical anatomy of normal tissues and organs. Prerequisite: Zoology 1-2 or the equivalent. Material fee, \$11. Lecture—MW 7:10-8:00 P.M.; laboratory—MW 8:10-10:00 P.M., TTh 7:10-9:00 P.M.

295 *Research* (3)

Investigation of special problems. Hours to be arranged.

299 *Thesis* (3)

THE GEORGE WASHINGTON UNIVERSITY

Washington 6, D. C.

Academic programs leading to degrees are offered in the following colleges and schools:

Junior College: Associate in Arts (A.A.) and Associate in Science (A.S.)
Columbian College: Bachelor of Arts (A.B.), Bachelor of Science (B.S.), Bachelor of Science in Medical Technology (B.S. in Med. Tech.), Master of Arts (A.M.), Master of Fine Arts (M.F.A.), and Master of Science (M.S.)
Graduate Council: Doctor of Philosophy (Ph.D.)
School of Medicine: Doctor of Medicine (M.D.)
Law School: Bachelor of Laws (LL.B.), Master of Laws (LL.M.), Master of Comparative Law (M. Comp. L.), Master of Comparative Law (American Practice) (M. Comp. L. (Am. Prac.)), and Doctor of Juridical Science (S.J.D.)
School of Engineering: Bachelor of Civil Engineering (B.C.E.), Bachelor of Electrical Engineering (B.E.E.), Bachelor of Mechanical Engineering (B.M.E.), Bachelor of Science in Engineering (B.S. in Eng.), Master of Science in Engineering (M.S. in Eng.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)
School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.) and Master of Science in Pharmacy (M.S. in Phar.)
School of Education: Bachelor of Arts in Education (A.B. in Ed.), Bachelor of Science in Home Economics (B.S. in H.E.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (Adv. Prof. Cert.), and Doctor of Education (Ed.D.)
School of Government, Business, and International Affairs: Bachelor of Arts in Government (A.B. in Govt.), Bachelor of Business Administration (B.B.A.), Master of Arts in Government (A.M. in Govt.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)
College of General Studies: Associate in Arts (A.A.(C.G.S.)), Associate in Science (A.S.(C.G.S.)), Associate in Secretarial Administration (A.Sec.Adm.), Bachelor of Arts (A.B.(C.G.S.)), Bachelor of Science in Cartography (B.S. in Cart.), Master of Arts (A.M.(C.G.S.)), Master of Arts in International Affairs (A.M. in I.A.), and Master of Business Administration (M.B.A.(C.G.S.)).

ANNUAL ISSUES OF THE UNIVERSITY BULLETIN

Requests for the following publications should be addressed as indicated.

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| College of General Studies..... | Dean of the College of General Studies |
| General Catalogue of the University..... | Director of Admissions |
| Graduate Council..... | Dean of the Graduate Council |
| Law School..... | Director of Admissions |
| School of Education..... | Director of Admissions |
| School of Engineering..... | Dean of the School of Engineering |
| School of Medicine..... | Director of Admissions |
| Summer Sessions..... | Dean of the Summer Sessions |
| Fellowships, Scholarships, Prizes, Financial Aid..... | Chairman, Committee on Scholarships |

THE GEORGE WASHINGTON UNIVERSITY

1821

The Junior College

1930

Columbian College (the Senior College)

1821

The Graduate Council

1893

The School of Medicine

1825

The Law School

1865

The School of Engineering

1884

The School of Pharmacy

1906

The School of Education

1907

The School of Government, Business, and International Affairs

1921

The College of General Studies

1950

The Division of University Students

1930

The Division of Special Students

1944

The Division of Air Science

1951

The Summer Sessions

1916

The University Hospital

1893

THE
GEORGE
WASHINGTON
UNIVERSITY

BULLETIN

THE CATALOGUE ISSUE
1961-62



WASHINGTON 6, D. C.

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VOL. LX

No. 13

CORRESPONDENCE DIRECTORY

Detailed information may be obtained by addressing inquiries as indicated below. For any information not included here, please write to the Director of Admissions, The George Washington University, Washington 6, D. C.

Information concerning courses of instruction and the programs of the several colleges and schools will be found in separate issues of the University Bulletin, which are listed on the inside back cover.

Admission.....Director of Admissions, Building
Air Science (ROTC).....Director of Air Science, Chapin Hall
Alumni Association.....Alumni Office, Bacon Hall
Foreign Students.....Adviser to Foreign Students, Building
Graduate Study

In Arts and Sciences

Master's degrees.....Dean of Columbian College of Arts and Sciences
Doctor of Philosophy.....Dean of The Graduate Council

In Education.....Dean of The School of Education

In Engineering.....Committee on Graduate Studies, School of Engineering

In Law.....Dean of The Law School

In Accounting, Business Administration, Business and Economic Statistics,
Economic Policy, Hospital Administration, International Affairs, Personnel
Administration, Public Administration, Public Affairs.....Dean
The School of Government, Business, and International Affairs

Housing

Men.....Director of Men's Activities, Building

Women.....Director of Women's Activities, Woodhull Hall

Scholarships.....Chairman, Committee on Scholarships, Building

Student Employment.....Student Employment Office, 2114 G Street NW

Summer Sessions.....Dean of the Summer Sessions, Building

Transcripts of Records.....Registrar, Building

Veterans Education.....Director of Veterans Education, Building

THE CATALOGUE ISSUE
1961-62

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WASHINGTON
UNIVERSITY
BULLETIN

VOL. LX

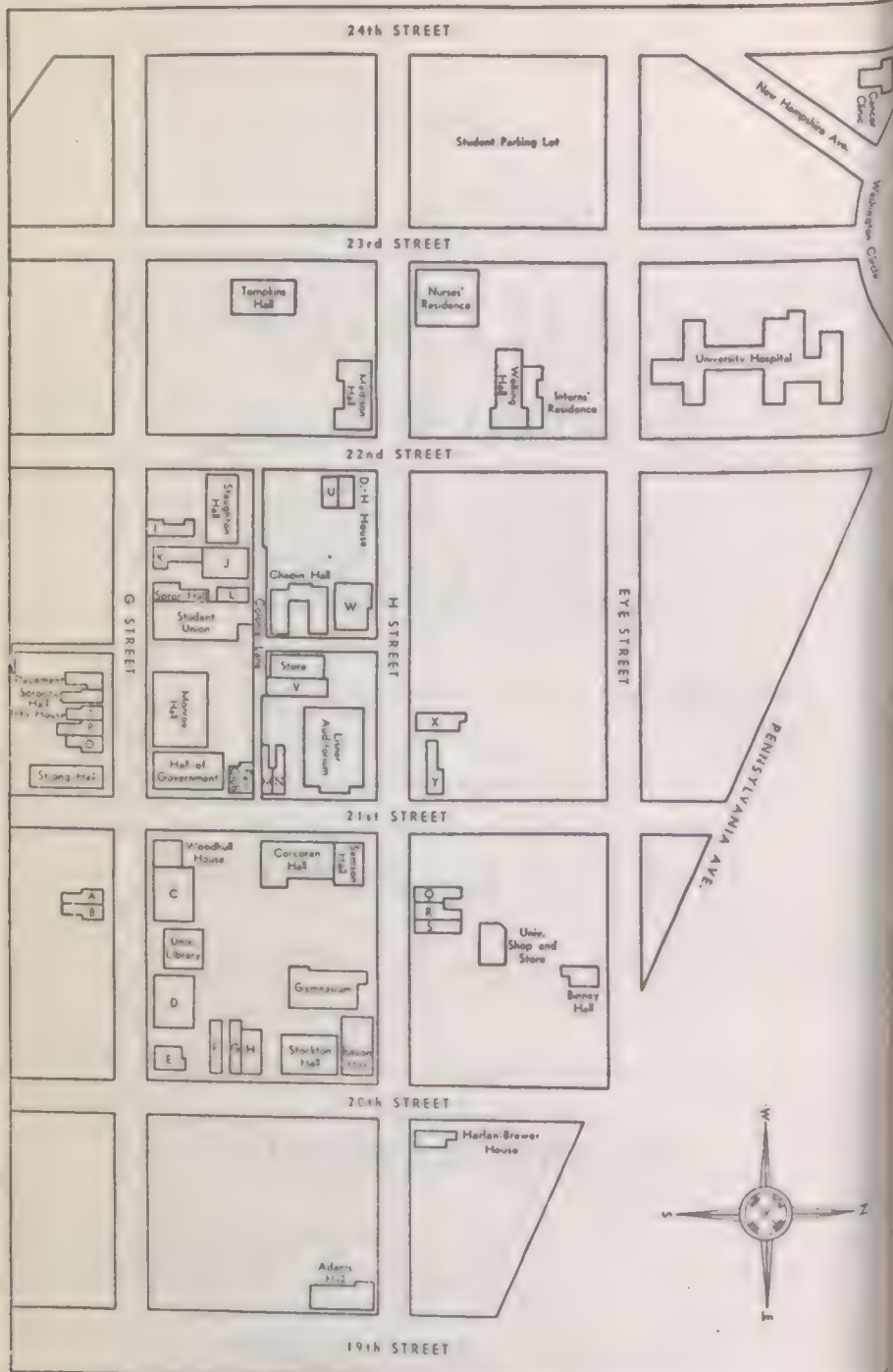
No. 13

THE CATALOGUE ISSUE

WASHINGTON 6, D. C.

PUBLISHED IN JULY
MCMLXI

BY THE UNIVERSITY



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THE UNIVERSITY CALENDAR

| 1961 | | | | | | | | 1962 | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|-------|-------|-------|-------|-------|-------|--|----------|-------|-------|-------|-------|-------|-------|--|-----------|-------|-------|-------|-------|-------|-------|---|--|--|--|--|--|--|--|--|
| July | | | | | | | | January | | | | | | | | July | | | | | | | | | | | | | | | |
| S | M | T | W | T | F | S | | S | M | T | W | T | F | S | | S | M | T | W | T | F | S | | | | | | | | | |
| | | | | | | 1 | | | 1 | 2 | 3 | 4 | 5 | 6 | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | | | | | | | |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 | | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | | | | | | | | |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | | 15 | 16 | 17 | 18 | 19 | 20 | 21 | | | | | | | | | |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 | | 21 | 22 | 23 | 24 | 25 | 26 | 27 | | 22 | 23 | 24 | 25 | 26 | 27 | 28 | | | | | | | | | |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 | | 28 | 29 | 30 | 31 | ..... | ..... | ..... |  | 29 | 30 | 31 | ..... | ..... | ..... | ..... |  |  |  |  |  |  |  |  |  |
| 30 | 31 | ..... | ..... | ..... | ..... | ..... |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| August | | | | | | | | February | | | | | | | | August | | | | | | | | | | | | | | | |
| ..... | ..... | 1 | 2 | 3 | 4 | 5 |  | ..... | ..... | ..... | ..... | 1 | 2 | 3 |  | ..... | ..... | ..... | 1 | 2 | 3 | 4 | | | | | | | | | |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | 5 | 6 | 7 | 8 | 9 | 10 | 11 | | | | | | | | | |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 | | 11 | 12 | 13 | 14 | 15 | 16 | 17 | | 12 | 13 | 14 | 15 | 16 | 17 | 18 | | | | | | | | | |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 | | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | 19 | 20 | 21 | 22 | 23 | 24 | 25 | | | | | | | | | |
| 27 | 28 | 29 | 30 | 31 | ..... | ..... |  | 25 | 26 | 27 | 28 | ..... | ..... | ..... |  | 26 | 27 | 28 | 29 | 30 | 31 | ..... |  |  |  |  |  |  |  |  |  |
| September | | | | | | | | March | | | | | | | | September | | | | | | | | | | | | | | | |
| | | | | | 1 | 2 | | | | | | 1 | 2 | 3 | | | | | | | | | 1 | | | | | | | | |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | | 11 | 12 | 13 | 14 | 15 | 16 | 17 | | 9 | 10 | 11 | 12 | 13 | 14 | 15 | | | | | | | | | |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 | | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | | | | | | | | | |
| | | | | | | | | | | | | | | | | 30 | ..... | ..... | ..... | ..... | ..... | ..... |  |  |  |  |  |  |  |  |  |
| October | | | | | | | | April | | | | | | | | October | | | | | | | | | | | | | | | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  | ..... | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | | | | |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 | | 8 | 9 | 10 | 11 | 12 | 13 | 14 | | 7 | 8 | 9 | 10 | 11 | 12 | 13 | | | | | | | | | |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 | | 15 | 16 | 17 | 18 | 19 | 20 | 21 | | 14 | 15 | 16 | 17 | 18 | 19 | 20 | | | | | | | | | |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 | | 22 | 23 | 24 | 25 | 26 | 27 | 28 | | 21 | 22 | 23 | 24 | 25 | 26 | 27 | | | | | | | | | |
| 29 | 30 | 31 | ..... | ..... | ..... | ..... |  | 29 | 30 | ..... | ..... | ..... | ..... | ..... |  | 28 | 29 | 30 | 31 | ..... | ..... | ..... |  |  |  |  |  |  |  |  |  |
| November | | | | | | | | May | | | | | | | | November | | | | | | | | | | | | | | | |
| ..... | ..... | ..... | 1 | 2 | 3 | 4 |  | ..... | ..... | 1 | 2 | 3 | 4 | 5 |  | ..... | ..... | ..... | ..... | 1 | 2 | 3 | | | | | | | | | |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 | | 6 | 7 | 8 | 9 | 10 | 11 | 12 | | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | | | | | | | | |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 | | 13 | 14 | 15 | 16 | 17 | 18 | 19 | | 11 | 12 | 13 | 14 | 15 | 16 | 17 | | | | | | | | | |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 | | 20 | 21 | 22 | 23 | 24 | 25 | 26 | | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | | | | | | | | |
| 26 | 27 | 28 | 29 | 30 | ..... | ..... |  | 27 | 28 | 29 | 30 | 31 | ..... | ..... |  | 25 | 26 | 27 | 28 | 29 | 30 | ..... |  |  |  |  |  |  |  |  |  |
| December | | | | | | | | June | | | | | | | | December | | | | | | | | | | | | | | | |
| | | | | | 1 | 2 | | | | | | | 1 | 2 | | | | | | | | | 1 | | | | | | | | |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 | | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | | | | | |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | 9 | 10 | 11 | 12 | 13 | 14 | 15 | | | | | | | | | |
| 17 | 18 | 19 | 20 | 21 | 22 | 23 | | 17 | 18 | 19 | 20 | 21 | 22 | 23 | | 16 | 17 | 18 | 19 | 20 | 21 | 22 | | | | | | | | | |
| 24 | 25 | 26 | 27 | 28 | 29 | 30 | | 24 | 25 | 26 | 27 | 28 | 29 | 30 | | 23 | 24 | 25 | 26 | 27 | 28 | 29 | | | | | | | | | |
| 31 | ..... | ..... | ..... | ..... | ..... | ..... |  |  |  |  |  |  |  |  |  | 30 | 31 | ..... | ..... | ..... | ..... | ..... |  |  |  |  |  |  |  |  |  |

THE UNIVERSITY CALENDAR*

1961-62

FALL SEMESTER:

| | | |
|--|----------------------|----------------|
| Junior College advising: all new students..... | Sept. 11-20 | Mon.-Wed. |
| School of Engineering advising: freshmen, sophomores, and all new students..... | Sept. 11-20 | Mon.-Wed. |
| School of Engineering placement tests: entering freshmen | Sept. 14 | Thurs. |
| Orientation Assembly: all new students..... | Sept. 15 | Fri. |
| Curriculum assemblies: new students attend one | Sept. 15 and 18..... | Fri. and Mon. |
| Placement tests (other than Engineering)..... | Sept. 19 | Tues. |
| Qualifying examinations | Sept. 19 | Tues. |
| School of Engineering graduate registration† | Sept. 19 and 20.... | Tues. and Wed. |
| University Faculty Meeting..... | Sept. 20 | Wed. |
| Registration* | Sept. 21-23‡ | Thurs.-Sat. |
| Classes begin* | Sept. 25 | Mon. |
| Subjects of Master's theses of Feb. candidates due in appropriate Dean's Office..... | Oct. 6 | Fri. |
| S.J.D. dissertations of Feb. candidates due..... | Oct. 6 | Fri. |
| Board of Trustees' Meeting..... | Oct. 12 | Thurs. |
| Fall Convocation | Oct. 21 | Sat. |
| Application for Feb. graduation due in Registrar's Office | Oct. 31 | Tues. |
| Veterans Day. Holiday | Nov. 11 | Sat. |
| Thanksgiving recess | Nov. 23-25 | Thurs.-Sat. |
| Ph.D. dissertations of Feb. candidates due | Dec. 1 | Fri. |
| Board of Trustees Meeting..... | Dec. 7 | Thurs. |
| Graduate Record Examination..... | Dec. 9 | Sat. |
| Christmas recess | Dec. 22-Jan. 2..... | Fri.-Tues. |
| Classes resume | Jan. 3 | Wed. |
| Master's theses of Feb. candidates due in appropriate Dean's Office..... | Jan. 3 | Wed. |
| D.Sc., Ed.D., and D.B.A. dissertations of Feb. candidates due in appropriate Dean's Office | Jan. 3 | Wed. |
| Last day of fall-semester classes..... | Jan. 17 | Wed. |
| Examination period | Jan. 22-27 | Mon.-Sat. |
| School of Engineering advising: freshmen, sophomores, and all new students..... | Jan. 22-31 | Mon.-Wed. |
| School of Engineering placement tests: entering freshmen | Jan. 25 | Thurs. |

SPRING SEMESTER:

| | | |
|---|---------------------|----------------|
| School of Engineering graduate registration† | Jan. 30 and 31..... | Tues. and Wed. |
| Placement tests (other than Engineering)..... | Jan. 31 | Wed. |
| Qualifying examinations | Jan. 31 | Wed. |
| Registration§ | Feb. 1-3 | Thurs.-Sat. |

* In the School of Medicine registration is conducted September 14, classes begin September 18.
† From 11:00 A.M. to 8:00 P.M.
‡ September 21 and 22, from 10:00 A.M. to 8:00 P.M.; September 23, from 10:00 A.M. to 1:00 P.M.
§ February 1 and 2, from 10:00 A.M. to 8:00 P.M.; February 3, from 10:00 A.M. to 1:00 P.M.

| | | |
|--|-------------------|-----------|
| Spring-semester classes begin..... | Feb. 5 | Mon. |
| Board of Trustees Meeting..... | Feb. 8 | Thurs. |
| Subjects of Master's theses of June candidates due in appropriate Dean's Office..... | Feb. 9 | Fri. |
| S.J.D. dissertations of June candidates due.... | Feb. 9 | Fri. |
| Winter Convocation. Holiday..... | Feb. 22 | Thurs. |
| Application for June graduation due in Registrar's Office | Feb. 28 | Wed. |
| Application for 1962-63 fellowships due..... | March 1 | Thurs. |
| Application for 1962-63 Engineering scholarships due | March 1 | Thurs. |
| Board of Trustees Meeting..... | March 8 | Thurs. |
| University Faculty Meeting..... | March 20 | Tues. |
| Ph.D., Ed.D., and D.B.A. dissertations of June candidates due in appropriate Dean's Office | March 30 | Fri. |
| Application for 1962-63 scholarships (other than Engineering and Law) due..... | March 31 | Sat. |
| Graduate Record Examination..... | April 7 | Sat. |
| Theses and dissertations of June Engineering candidates due in Dean's Office..... | April 9 | Mon. |
| Easter recess | April 20-25 | Fri.-Wed. |
| Master's theses of June candidates (other than Engineering) due in appropriate Dean's Office | April 27 | Fri. |
| S.J.D. dissertations of Oct. candidates due.... | May 4 | Fri. |
| Board of Trustees Annual Meeting..... | May 10 | Thurs. |
| Last day of spring-semester classes..... | May 16 | Wed. |
| Examination period | May 21-26 | Mon.-Sat. |
| Memorial Day. Holiday..... | May 30 | Wed. |
| Baccalaureate Service | June 3 | Sun. |
| Commencement | June 6 | Wed. |

SUMMER SESSIONS*

| | | |
|--|-------------------|-------------|
| Registration for eight-week term..... | June 18 | Mon. |
| Classes begin | June 19 | Tues. |
| Independence Day. Holiday..... | July 4 | Wed. |
| Application for Oct. graduation due in Registrar's Office† | Aug. 1 | Wed. |
| Eight-week term ends..... | Aug. 10 | Fri. |
| Master's theses of Oct. candidates due in appropriate Dean's Office..... | Aug. 10 | Fri. |
| Ed.D. and D.B.A. dissertations of Oct. candidates due in appropriate Dean's Office.... | Sept. 7 | Fri. |
| Registration for fall semester 1962-63..... | Sept. 20-22 | Thurs.-Sat. |

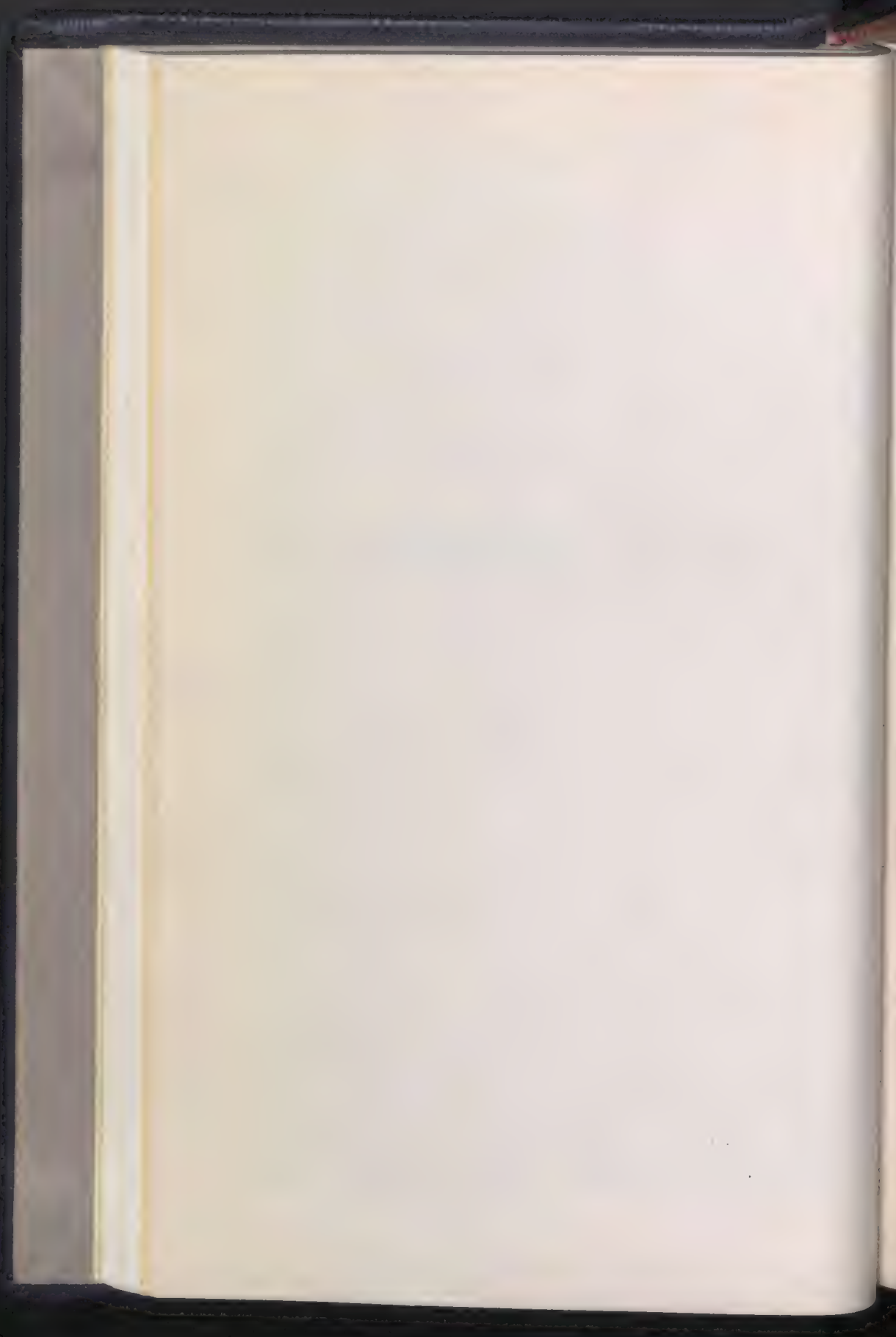
* For all schools and colleges offering courses in the Summer Sessions except the Law School and the School of Education.

The dates of the calendar of the Law School will be announced.

The calendar for the special sessions of the School of Education is as follows: Twelve-week Evening Session—June 11 to August 31, registration June 11; Nine-week Session—June 19 to August 17, registration June 18; Six-week Session—July 10 to August 16, registration July 9.

† Except for students in the School of Education registering after August 1 for the first time in the 1961 Summer Sessions.

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1962

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*Frank Harvey Weitzel, A.B., LL.B.; General Accounting Office

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The Research Projects listed in this section are special projects which are set up for the specific purpose of attacking in an academic atmosphere problems submitted by the sponsoring agency. Cooperation between these projects and the various departments of instruction is as close as the nature and needs of the projects and departments will permit. The projects are listed in the order in which they were undertaken by the University.

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The Electronics Research Project does work in the general fields of digital computer circuitry and logic, information storage and retrieval, and systems reliability. This project operates under contracts with the Department of Defense and under grants from the National Science Foundation.

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THE LOGISTICS RESEARCH PROJECT (NAVY)

The purpose of the Logistics Research Project is to study Logistics problems in all their aspects, to develop more efficient and expeditious methods of solving Logistics problems, and the application of computing machine techniques to the solution of these problems. As part of this study a large collection of operating data is being classified and coded for statistical study using modern machine methods. This project is operated under a contract with the Department of the Navy.

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THE HUMAN RESOURCES RESEARCH OFFICE

The Human Resources Research Office was established by means of a contract between the Department of the Army and The George Washington University to carry out an integrated Army program of human resources research. The work is conducted mainly in the fields of training methods and motivation, morale, and leadership. A research division and supporting services including a statistical office are located on the University campus. Five research units work under the command of Headquarters, Continental Army Command, and the technical supervision of the Washington Office. At present they are situated at Fort Knox, Kentucky; Presidio of Monterey, California; Fort Benning, Georgia; Fort Bliss, Texas, and Fort Rucker, Alabama.

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ARMY LOGISTICS RESEARCH PROJECT

The Army Logistics Research Project is engaged in a program leading to the development and strengthening of logistics theory and the application of such theory to practice.

Relationships important to managerial decision-making are stressed. The research extends to systems design, analysis of systems performance, and the testing of methodology to meet logistical operating criteria of the present and for the Army of the future.

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BIOMETRIC LABORATORY

The Biometric Laboratory applies mathematical techniques to biological problems related to mental health. It was established under a contract with the National Institutes of Health. The Laboratory assists investigators throughout the United States in planning research and in analyzing data. The majority of these research projects concern the effects of drugs on behavior.

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 Birdie Harris, *Manager of the Book Store and the Student Union*
 Karolina Hedler, B.S., *Assistant Manager of the Book Store and the Student Union*
 Alexandru Stoianovici, A.M., *Assistant Manager of the Book Department of the University Book Store*

Robert Romero, *Assistant Manager of the Book Department of the University Book Store*

Vince Francis Baca, *Stores Clerk*

Gloria Mercedes Harris, *Assistant in the University Book Store*

Barbara Hamilton, *Clerk-Typist in the University Book Store*

Gizella Rona, *Clerk-Typist in the University Book Store*

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Della Clark, *Telephone Operator*

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James Francis Delany, Jr., *Photographer in Medical School Photographic Laboratory*

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John Henry Hann, *Stockroom Clerk in Chemistry*

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Sonya Sue Kelley, *Technician in Microbiology*

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 Marie Norton Lynch, *Assistant, Hospital Library*
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 Alma Hough Billmyer, *Secretary*
 Gloria Jean Whitmer, *Secretary*
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 Marie Frances Needham, *Alumni Representative Assistant*

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Science
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 Frederick Lowell Moore, B.S., *Assistant Addressograph Operator*

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 Louise Wilson Watts, *Secretary*

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 Mary Chester Applewhite, *Editorial Assistant*
 Fredrica Foster Hodges, A.B., *Assistant Secretary*
 Marion Barbara Marshall, A.B., *Assistant Secretary*

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Jacqueline Isabel Olsen, M.S. in Ed., *Assistant to the Director of Activities for*
Women

Edward Ferero, A.B. in Govt., *Housing Assistant in the Office of the Director of Activities for Men; Managing Director, Dramatic Activities*
 Jane Elizabeth Bayol, *Secretary, Office of the Director of Activities for Women*
 Diane Baker, *Clerk-Typist, Office of the Director of Activities for Women*
 Deane McDonald Eriksson, *Student Activities Assistant*

INTERCOLLEGIATE ATHLETICS

William Jennings Reinhart, B.B.A., *Head Baseball and Head Basketball Coach*
 James Vernon Camp, A.M., *Head Football Coach*
 Raymond George Hanken, B.S. in P.E., A.M. in Ed., *Assistant Football Coach*
 George Klein, A.B. in Ed., *Assistant Basketball and Baseball Coach*
 Harry Ledford, *Athletic Trainer*
 Ardith Laurina Harding, *Secretary in the Department of Intercollegiate Athletics*

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Robert Howe Harmon, A.B., M.D., *Director of the Glee Clubs*
 Grace Ruble Harmon, *Associate Director of the Glee Clubs*

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Janet Wildman Johnson, A.M., *Assistant Director of Veterans Education*
 Margaret Lamb, A.B., *Assistant to the Director of Veterans Education*
 Margaret Elizabeth Robinson, *Receptionist and Chief Clerk*

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Zella Huse, A.M., *Assistant Director*
 Grace Louise Toon, *Secretary*

UNIVERSITY HOSPITAL

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 Francisco Paolo Ferraraccio, B.S., *Assistant Administrator*
 Raymond Francis Whitehair, *Administrative Assistant*
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 Sadie Estell Oakley, *Chief, Admissions Department*
 Thelma Moore, *Chief, Telephone Department*
 Louise O'Neal, A.B., R.N., *Assistant Director of Nursing*
 Laurence Erwin Johnson, A.B., M.H.A., *Administrative Assistant, Outpatient Department*
 Charles Clark Hayes, *Executive Housekeeper*
 Frank Leonard Sasher, *Manager, Laundry Department*
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 Irma Lee Jackson, *Resident Director, Dolly Madison Hall*
 Jane O'Roark Abbott, Mus.B., *Assistant Resident Director, Dolly Madison Hall*
 Timothy Dean Mead, A.B., *Resident Manager, John Quincy Adams Hall for Men*
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The University

HISTORY AND ORGANIZATION

HISTORY

The idea of a university located in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government."

It was George Washington's hope that the "General Government" would extend toward such an institution "a fostering hand". No steps were taken by Congress to carry out the provisions of Washington's will, and the stock he had bequeathed for the establishment of a university in the District of Columbia became valueless owing to the failure of the Potomac Canal properties.

Meanwhile, however, a movement was started by private persons under the leadership of Luther Rice to establish an institution of higher learning at the seat of the National Government for the education of the Baptist ministry and to afford general collegiate training. In 1819 an association was formed by Luther Rice, Obadiah B. Brown, Spencer H. Cone, and Enoch Reynolds for the purpose of raising funds to buy land for the use of the college.

A group of the Nation's leaders who were especially interested in Washington's idea became patrons of the college and contributed to funds raised for the purchase of land and erection of buildings. Among them were James Monroe, President of the United States; William H. Crawford, Secretary of the Treasury; John C. Calhoun, Secretary of War; William Wirt, Attorney General; Return J. Meigs, Postmaster General; and thirty-two members of Congress.

Legally to implement the college a petition was made to Congress for the incorporation of "the General Convention of the Baptist Denomination in the District of Columbia for evangelical and literary purposes". This petition was denied by Congress on April 26, 1820, because of its sectarian character.

Failing to obtain a denominational charter members of the association enlarged their objective to embrace national aims, and with the sponsorship of Government leaders there was presented in Congress a bill for the incorporation of "the Columbian Society for literary purposes", it being proposed to realize in this way "the aspirations of Washington, Jefferson and Madison for the erection of a university at the seat of the federal government."

Acting upon this second petition, on February 9, 1821, Congress chartered Columbian College in the District of Columbia, inserting in the charter by special action the provision "that persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College or denied any of the privileges, immunities or advantages thereof, for or on account of his sentiments in matters of religion".

Thus Columbian College in the District of Columbia was chartered by Congress as one of the early nonsectarian institutions of higher learning in the United States, under the distinguished favor of President James Monroe and members of his Cabinet.

A tract of approximately forty-seven acres, extending about one-half mile northwest of Boundary Street (Florida Avenue) between Fourteenth and Fifteenth Streets, was purchased and by 1822 the main building was completed sufficiently to use.

Two years later, when the first Commencement was held on December 15, 1824, Congress and the Supreme Court adjourned their sessions to enable their members to attend the exercises. President Monroe, John Quincy Adams, John C. Calhoun, Henry Clay, and the Marquis de Lafayette headed the eminent company in attendance.

By an act of Congress of March 3, 1873, the name of the College was changed to "Columbian University", in recognition of the enlarged scope of the institution. In 1884 the University was moved from its first location on "College Hill", now Columbia Heights, to the new University Hall built for it at Fifteenth and H Streets. Nearby buildings accommodated the School of Medicine and somewhat later, the Law School.

For a period of six years, from 1898 to 1904, the University was placed under control of the Baptist Denomination. In 1904 an act restoring the original secular character of the University and authorizing change of name to The George Washington University was passed by Congress.

Subsequently all colleges, schools, and divisions of the University except the School of Medicine were brought together in the area bounded by Nineteenth, Twenty-third, and G Streets, and Pennsylvania Avenue NW. The School of Medicine is situated on H Street between Thirteenth and Fourteenth Streets NW.

The endowment of the University is \$7,530,000.

In 1930 a new plan of academic organization for the liberal arts work was effected in the establishment of the Junior College and the redefining of graduate work.

PURPOSE AND OBJECTIVES

The main purpose of The George Washington University may be briefly stated: to establish and maintain the high tradition of the University ideal in the political center of the Nation. In the words of the Bill of Incorporation, introduced and subsequently enacted by Congress, in 1821, it was proposed to realize "the aspirations of Washington, Jefferson, and Madison, for the erection of a university at the seat of the Federal Government." The idea of a university so situated was, in the minds of the early sponsors and patrons, to afford a relation between the traditional objectives of higher education, and, as Washington stated: "knowledge in the principles of Politics and good Government." This central idea of a University functioning in the Capital of the Nation, nonsectarian, free of sectional limitations, conscious of its wide American relationships, and open to the ever-increasing international influences which bear upon it, has been continuous through nearly a century and a half of difficult growth and adaptation.

The main, simple purpose of this University has been therefore, to develop the university ideal in the place of greatest national significance, flexible before the changing needs of its growing national constituency and loyal to the traditional principles of learning and research, in providing through disciplined reason, wisdom for the individual and his society. This statement intends to differentiate University objectives from the incorporation of the more specific objectives of the colleges and schools which comprise the University. Theirs is the problem of relating the university ideal to the particular application of scholarship and professional learning in their several fields.

THE COLLEGES, SCHOOLS, AND DIVISIONS

The George Washington University includes fourteen colleges, schools, and divisions, as follows:

The Junior College offers the work of the first two years of the four-year college program in the liberal arts and sciences and two years of preprofessional work. Each of these curricula leads to the degree of Associate in Arts. It also offers two-year terminal curricula. Those in Accounting and Secretarial Studies lead to the degree of Associate in Arts; those in Home Economics and Physical Sciences lead to the degree of Associate in Science.

Columbian College offers the work of the junior and senior years of the four-year college program in the liberal arts and sciences leading to the degrees of Bachelor of Arts and Bachelor of Science. In cooperation with the Department of Pathology and the University Hospital, Columbian College offers a course in Medical Technology leading to the degree of Bachelor of Science in Medical Technology. It also offers the studies leading to the degrees of Master of Arts, Master of Science, and Master of Fine Arts.

The Graduate Council offers a program of advanced study and research leading to the degree of Doctor of Philosophy.

The School of Medicine offers work leading to the degree of Doctor of Medicine.

The Law School offers professional and graduate courses leading to the degrees of Bachelor of Laws, Master of Laws, Master of Comparative Law, and Doctor of Juridical Science.

The School of Engineering offers courses leading to the Engineering Technologists Certificate and the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of Science in Engineering, Master of Science in Engineering, Master of Engineering Administration, and Doctor of Science.

The School of Pharmacy offers courses leading to the degrees of Bachelor of Science in Pharmacy and Master of Science in Pharmacy.

The School of Education offers undergraduate programs leading to the degrees of Bachelor of Arts in Education, Bachelor of Science in Home Economics, and Bachelor of Science in Physical Education, and graduate studies leading to the degrees of Master of Arts in Education and Doctor of Education.

The School of Government, Business, and International Affairs offers work leading to the following degrees: (1) Bachelor of Arts in Government with a major in International Affairs or Public Affairs; (2) Bachelor of Business Administration with a major in Accounting, Business Administration, or Business and Economic Statistics; (3) Master of Arts in Government with a major field in International Affairs, Public Affairs, Public Administration, Personnel Administration, or Economic Policy; (4) Master of Business Administration with a major field in Accounting, Business and Economic Statistics, General Business Administration, Hospital Administration, or Personnel Administration; (5) Doctor of Business Administration.

The College of General Studies supplements the adult education program of the University through its Off-Campus Division, Campus Division, and Division of Community Services. This College offers programs leading to the degrees of Associate in Arts; Associate in Science; Associate in Secretarial Administration; Bachelor of Arts; Bachelor of Science in Cartography; Master of Arts in the fields of Controllorship, Governmental Administration, and Personnel Management; Master of Business Administration; and Master of Arts in International Affairs.

The Division of University Students makes available courses for mature students, not candidates for degrees in this University.

The Division of Special Students makes available courses for students in the process of qualifying for degree candidacy.

The Division of Air Science offers a program of Air Force ROTC training which is integrated with the curricula of the colleges and schools of the University and leads to appointment as a commissioned officer in the United States Air Force Reserve.

The Summer Sessions.

INSTRUCTIONAL DIVISIONS

The instructional divisions, established at The George Washington University in 1930, are organized on the basis of the relationship of course content, interrelation of methods and prerequisites, and similarity of background and viewpoint. Originally there were four divisions, Languages and Literatures, Mathematics and Physical Sciences, Natural Sciences, and Social Sciences. The plan is being restudied and a provisional alignment has been made which adds two new divisions, Applied Sciences and Medical Sciences.

ADMINISTRATIVE AND RESEARCH ACTIVITIES

ADMINISTRATIVE UNITS

The University maintains the following Administrative Units: Health Administration, Veterans Education, the Reading Clinic, the Speech Clinic, and the Testing and Counseling Center.

RESEARCH PROJECTS

Research projects sponsored by agencies of the Federal Government and by private foundations and industries are conducted. Cooperation between these projects and the various departments of instruction is as close as the nature and needs of the projects and departments will permit.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The Law School is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association. The School of Medicine is a member of the Association of American Medical Colleges and is one of the medical colleges which have been continuously approved by the American Medical Association. The School of Pharmacy is accredited by the American Council on Pharmaceutical Education. It is a member of the American Association of Colleges of Pharmacy. The School of Engineering is on the accredited list of the Engineers' Council for Professional Development. The School of Education is a charter member of the American Association of Colleges for Teacher Education and is accredited by the National Council for Accreditation of Teacher Education.

LOCATION

The George Washington University is in downtown Washington four blocks west of the White House and east of the Potomac River with its extensive parkway. Readily accessible to the University are many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Army, the Department of the Navy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor, as well as the National Archives, the Capitol, the Library of Congress, the National Academy of Sciences, the Pan American Union, the National Gallery of Art, and the Corcoran Gallery of Art.

GOVERNMENT

The government and general educational management of The George Washington University are vested in a self-perpetuating Board of Trustees, with the President of the University as a member *ex officio*. The members of the Board are named for a period of three years and are divided into three classes. The members of one class are elected at each annual meeting to fill the places of the members whose terms of office expire. Two members of each class are nominated by the Alumni Association.

EDUCATIONAL FACILITIES

BUILDINGS

Buildings, grounds, and equipment are valued at approximately \$25,000,000.

The buildings of the Junior College; Columbian College; the Graduate Council; the Law School; the School of Engineering; the School of Pharmacy; the School of Education; the School of Government, Business and International Affairs; the College of General Studies; the Division of University Students; the Division of Special Students; the Division of Air Science; the University Hospital and Outpatient Department; and the Cancer Clinic are located between Nineteenth and Twenty-fourth Streets and between Pennsylvania Avenue and G Street NW. The School of Medicine is at Fourteenth and H Streets NW. The buildings of the University are as follows:

- John Quincy Adams Hall, 730 Nineteenth Street. Residence hall for men.
- Bacon Hall, 2000 H Street. Named in honor of the late Joel Smith Bacon, President of the University from 1843 to 1854. Offices of the Dean of the Graduate Council, the Dean for Sponsored Research, the Assistant to the President, the Development Division, the Army Logistics Research Project, the Educational Counselor. Offices and lounge for the Law Faculty; the Alumni Office; Alumni Reception Room.
- Binney Hall, 2018 I Street. Named in honor of the late Joseph Getchell Binney, President of the University from 1855 to 1858. Offices, classrooms, and laboratories of the Reading Clinic.
- Chapin Hall, 2128 H Street (rear). Named in honor of the late Stephen Chapin, President of the University from 1828 to 1841. Offices and classrooms of the Air Force ROTC.
- Corcoran Hall, 725 Twenty-first Street. Named in honor of the late William W. Corcoran, benefactor of the University and a former member of the Board of Trustees. Offices of the Treasurer, the Cashier, the departments of Chemistry and Physics; Chemistry Research Project; the chemistry and physics laboratories; classrooms.
- Davis-Hodgkins House, 731 Twenty-second Street. Offices and lounges of engineering students' organizations.

- Everglades Apartments, 2223 H Street. Residence hall for nurses.
- Faculty Club House, 714 Twenty-first Street.
- Gymnasium, 2010-12 H Street.
- Hall of Government, 710 Twenty-first Street. The gift of the late Mrs. Henry Alvah Strong, former Trustee of the University. Offices of the Dean of the School of Government, Business, and International Affairs; the departments of Accounting, Business and Public Administration, Economics, History, Political Science, and Statistics. Offices of the Air Force Advanced Management Program and Navy Graduate Comptrollership Program; classrooms.
- Harlan-Brewer House, 1923 H Street. Offices of law student organizations, and J. C. A. E. Study; lounges, reading rooms.
- Hospital and Outpatient Department, Washington Circle.
- Hospital Staff Office Building, 818 Twenty-second Street.
- International House, 2110 G Street. Office of the Adviser to Students from Foreign Countries; club rooms.
- Lisner Auditorium, 730 Twenty-first Street. The gift of the late Abram Lisner, former Trustee of the University. The Auditorium; Lisner Lounge; offices and classrooms of the Department of Speech, the Speech Clinic, and the housing officer; Athletic Ticket Office.
- Dolly Madison Hall, 736 Twenty-second Street. Residence hall for women.
- James Monroe Hall, 2115 G Street. Offices of the Dean of the Junior College, the Dean of Columbian College, the Dean of the Division of University Students, the Dean of the School of Education; the departments of Education, English (English and American Literature), Germanic Languages, Journalism, Mathematics, Psychology, and Secretarial Studies; classrooms.
- Office of the President, 2003 G Street. Offices of the President, the Provost and Dean of Faculties, Associate Dean of Faculties, and Administrative Secretary.
- Placement Office, 2114 G Street.
- Samson Hall, 2036 H Street. Named in honor of the late George Whitefield Samson, President of the University from 1859 to 1871. Comptroller's Office; Disbursing Office; offices of the departments of Chemistry, Geology, and Physics.
- School of Medicine, 1335-1339 H Street. Offices of the Dean and Staff of the School of Medicine; the Medical Library; laboratories; lecture rooms; research laboratories; student and faculty lounges; and University Medical Bookstore.
- Sorority Halls:
- 2112 G Street. Apartments of Kappa Alpha Theta and Kappa Delta sororities.
 - 2129 G Street. Apartments of Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Zeta Tau Alpha, and Kappa Kappa Gamma sororities.
 - 2131 G Street. Apartment of Delta Gamma Sorority.
 - 2137 F Street. Apartment of Alpha Epsilon Phi Sorority.
 - 802 Twenty-first Street. Apartment of Phi Sigma Sigma Sorority.
- Staughton Hall, 707 Twenty-second Street. Named in honor of the late William Staughton, President of the University from 1821 to 1827. Offices and laboratories of the Navy Logistics Research Project.
- Stockton Hall, 720 Twentieth Street. Named in honor of the late Rear Admiral Charles Herbert Stockton, President of the University from 1910 to 1918. Law School; offices of the Dean of the National Law Center and the Dean and Faculty of the Law School; library, and lecture halls.
- Hattie M. Strong Hall, 620 Twenty-first Street. Named in honor of the donor, the late Mrs. Henry Alvah Strong, former Trustee of the University. Residence hall for women.
- Student Union, 2125 G Street. Offices of student organizations, student cafeteria and snack bar, reading room, lounge, game and music room, and the "Lost and Found" Office.
- Tompkins Hall of Engineering, 725 Twenty-third Street. The gift of the late Charles H. Tompkins, former Trustee of the University. Offices of the Dean of the School of Engineering; the departments of Civil, Electrical, and Mechanical Engineering; the programs in Engineering Administration, Engineering Science, and Metrology; the Center for Measurement Science; Electronics Research Project, National Aeronautics Space Administration; Engineering testing laboratories, general laboratories, drafting rooms, and classrooms.
- University Book Store, 2120 H Street. University Medical Bookstore, 1335 H Street.
- University Library, 2023 G Street. The gift of the late Abram Lisner, former Trustee of the University. The library, rooms of the Board of Trustees, Faculty Conference Room, classrooms.

- The Helen L. and Mary E. Warwick Memorial Building, 2300 K Street. Diagnostic and treatment rooms, and research laboratories of The George Washington University Cancer Clinic.
- Welling Hall, 814 Twenty-second Street. Named in honor of the late James Clarke Welling, President of the University from 1871 to 1894. Residence hall for men.
- Woodhull House, 2033 G Street. Gift of the late General Maxwell Van Zandt Woodhull, former Trustee of the University. Office of the Director of Activities for Women; meeting rooms for student activities.
- Building A, 2026 G Street. Offices of the Department of Romance Languages.
- Building B, 2024 G Street. Offices, laboratories, and classrooms of the Department of Home Economics.
- Building C, 2029 G Street. Offices of the Registrar and the Director of Admissions; offices and laboratories of the departments of Biology, Botany, Geology, and Zoology; language laboratories; classrooms.
- Building D, 2013 G Street. Offices of the Business Manager, Maintenance; Mail Room; Human Resources Research Project.
- Building E, 2003 G Street. Offices of the President, the Provost and Dean of Faculties, Associate Dean of Faculties, and Administrative Secretary; office of the Department of Classical Languages.
- Building F, 706 Twentieth Street. Offices of the Dean of the College of General Studies.
- Building G, 712 Twentieth Street. Offices of the Department of English (Composition section); Academic Editor.
- Building H, 714-16 Twentieth Street. Offices and locker rooms of the Department of Physical Education for Women.
- Building I, 2135 G Street. Offices, classrooms, and laboratories of the Department of Geography.
- Buildings J and L, 2131 and 2129 G Street (rear). Classrooms and locker rooms of the Department of Physical Education for Women.
- Building K, 817 Twenty-third Street. Classroom, playing court, locker rooms, and office of the Department of Physical Education for Women.
- Buildings M and N, 716-18 Twenty-first Street. Offices of the departments of Philosophy and Slavic Languages; offices and laboratories of the Testing and Counseling Center.
- Building O, 2106 G Street. Offices of the Department of Religion and University Chapel.
- Building P, 2108 G Street. Offices of the Student Health Service and the Dean of the Division of Special Students.
- Building Q, 2029 H Street. Offices of the Director of Activities for Men, the Director of Veterans Education, and the Superintendent of Maintenance.
- Building R, 2027 H Street. Offices of the Director of Athletics, and the Athletic Staff.
- Building S, 2025 H Street. Offices of the Department of Physical Education for Men and Public Relations.
- Building T, 2110 G Street. Offices of the Dean of the Summer Sessions; Chairman of Committee on Scholarships; International House (see International House).
- Building U, 729 Twenty-second Street. Army Research Office.
- Building V, 2114 H Street. Research laboratories of the Department of Physics.
- Building W, 2128 H Street. Offices of the Dean and Faculty of the School of Pharmacy; pharmacy laboratories; classrooms.
- Building X, 2107 H Street. Offices of the departments of Art and Sociology and Anthropology; Population Research Project; Faculty offices.
- Building Y, 802 Twenty-first Street. Offices of the Department of Business and Public Administration, Center for Behavioral Sciences.
- Building Z, 708 Twenty-second Street. Offices of the Patent, Trade-Mark, and Copyright Foundation.

LIBRARY FACILITIES

The Library collections of The George Washington University are housed in the University Library, the general library of the University; and in the departmental libraries of law, in Stockton Hall, and medicine, in the School of Medicine.

These collections contain approximately 352,000 volumes—272,600 in the University Library, 56,400 in the Law Library, and 23,000 in the Medical Library. Approximately 10,000 volumes a year are added to the Library's resources. Endow-

ments, supplementing the University appropriation, provide books in the fields of American civilization, American literature, foreign service, history, public finance, and the social sciences; and gifts from many sources have enriched the collections. The Libraries currently receive 1,800 periodicals.

In the modern University Library building, erected in 1939, on the first three floors are the delivery hall, card catalogue, reference and main reading rooms, periodical room, and reserve book rooms; on the fourth floor are ten planned seminar rooms. To the original 135,000 volume eight-tier stack of modern steel construction has been added a similar unit of 170,000 volume capacity with 50 study carrels.

Of the special subject collections in the University Libraries, the most recent acquisition is the internationally known library of the Carnegie Endowment for International Peace, which was assembled during forty years of its activity in Washington, and was purchased by the University. The collection contains 50,000 bound volumes and 20,000 pamphlets in the fields of international law and relations, history, and economics. Other collections in the Library are the W. Lloyd Wright collection of Washingtoniana, acquired in 1950; the Richard Heinzel Collection of Germanic philology and literature; the Curt Wachsmuth Collection of Greek and Roman literature, archaeology, and history; the Mount Vernon Collection on political history, international law, and the social sciences; a representative collection of Spanish American books, the gift of the governments of Hispanic America; and the Chauncey Mitchell Depew Public Speaking Collection.

Information concerning the use of the Libraries may be obtained at the Library service desks. A classified list on cards of selected recent acquisitions is available at frequent intervals, in addition to the complete information in the card catalogue. Monthly art exhibits are held on the first and second floors of the University Library during the academic year.

The hours of the University Library and the Law Library are Monday through Friday, 9:00 A.M. to 10:00 P.M.; Saturday, 9:00 A.M. to 5:00 P.M.; Sunday, 2:00 to 6:00 P.M. The Medical Library is open Monday through Friday, 9:00 A.M. to 10:00 P.M.; Saturday, 9:00 A.M. to 5:00 P.M.

The Library is administered for the curricular, reference, and recreational needs and interests of the students. Instruction in the use of the library is given in the required English courses, and by the reference librarians. The Library endeavors to assist students and all members of the University to use the rich library resources of Washington and the unusual opportunities they offer for extensive research. Inter-library loan arrangements are maintained with other libraries in the city and in the United States.

The student has access to the Library of Congress, the Public Library of the District of Columbia and its branches, the library of the Pan American Union, the Library of the Bureau of Railway Economics, the Library of the United States Department of Agriculture, the Library of the United States Office of Education, the National Library of Medicine, the Library of the Smithsonian Institution, and many of the other great special collections of the government departments.

ADMISSION

All colleges, schools, and divisions of the University accept men and women.

Students are admitted to all colleges, schools, and divisions, except the School of Medicine, at the beginning of each semester and summer session; however, Bachelor of Laws candidates in the Law School may begin their studies in the fall or spring semester but not in the summer term.

Students are admitted to the School of Medicine only at the beginning of the fall semester.

The University reserves the right to refuse admission to any student with an academic record which creates doubt of his ability to succeed in college or who, for any other reason, would not be an acceptable student.

APPLICATION FOR ADMISSION

Forms for application for admission are available at the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D. C.; telephone: FEderal 8-0250, extension 344. The completed form should be returned to the Office of the Director of Admissions, with an application fee of \$10 for a degree candidate; \$5 for a non-degree candidate. The degree candidate must attach to his application a recent photograph, signed by him.

Applications should be filed by July 1 for the fall semester, January 1 for the spring semester, and May 1 for the Summer Sessions. However, to insure consideration for admission, applicants for undergraduate degrees and for Master's degrees (in all but exceptional cases) *must* file completed applications in the Office of the Director of Admissions no later than Wednesday, September 6, for the fall semester; Tuesday, January 17, for the spring semester; and Monday, June 5, for the Summer Sessions. Applications for nondegree status must be filed by 5:00 P.M. on the day before the registration dates as printed in the University calendar.

An applicant from a secondary school must send the high school record form provided by the University to his high school principal, with the request that the completed form be mailed directly to the Office of the Director of Admissions.

An applicant who has attended one or more institutions of higher learning must request each registrar to mail directly to the Office of the Director of Admissions a transcript of his record, *even though credits were not earned.* An honorable dismissal is required from the institution last attended.

TEST INFORMATION

The requirement of tests for Junior College and School of Engineering applicants coming directly from secondary school is specified in the entrance statement of these divisions. The appropriate report of the Graduate Record Examination, when available, should accompany application for admission to graduate degree candidacy.

Arrangement for tests is the responsibility of the applicant and should be made with the College Entrance Examination Board, 20 Nassau Street, Princeton, New Jersey, not less than one month before the date of the test. The Bulletin of Information, obtainable without charge from the College Entrance Examination Board, contains descriptions of the tests as well as rules regarding applications, fees, reports, and the conduct of the tests; lists of examination centers; examination dates; and an application blank. On the application for the test, the student should specify

that the scores be sent to the Director of Admissions, The George Washington University, Washington 6, D. C.

College Entrance Board tests are given at a large number of examination centers throughout the United States, including Washington, D. C.

If the Committee on Admission and Advanced Standing prescribes other tests, necessary instructions will be sent to the applicant by the Director of Admissions.

ADVANCED STANDING

CREDIT FOR ADVANCED PLACEMENT EXAMINATIONS

Advanced standing may be granted for study at the collegiate level in advanced courses in an approved secondary school, if substantiated by satisfactory performance in the Advanced College Placement Examination. Arrangement for the examination is the responsibility of the applicant and should be made with the College Board Advanced Placement Examinations, Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

The applicant must request the examining service to submit the test papers and scores to the Office of Admissions. Consideration is given to both the quality of performance on the examination and the quality and content of the courses of study completed by the applicant.

Total credit that may be granted is limited to 30 semester hours.

CREDIT FROM HIGHER INSTITUTIONS

Properly certified courses taken at accredited colleges or universities may be applied toward a degree at this University, subject to the curriculum requirements and regulations of the school or college to which admission is sought. Work of low pass grade (such as *D* or the equivalent) will not be considered for transfer. Advanced standing may be assigned only upon the presentation of satisfactory credentials.

The University reserves the right to refuse credit for transfer in whole or in part, or to allow it provisionally. Credit so given may be withdrawn because of subsequent poor work.

The student must be in good standing as to scholarship and conduct. He must be eligible to return to the last previously attended institution in the semester for which he seeks admission to this University.

If the transcript of record from such an institution includes the record of his secondary school work, it is not necessary for the applicant to have forwarded a separate record from the principal of the secondary school.

READMISSION

A student who has previously registered in the University but who did not attend during the semester prior to registration (summer session excluded) should file an application for readmission two weeks in advance of registration. If the student applies as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must have complete, official transcripts sent to the Office of the Direc-

tor of Admissions from each institution attended before his application will be considered. Applications for readmission are considered on the basis of regulations currently effective.

TRANSFER WITHIN THE UNIVERSITY

For information concerning transfer from one college, school, or division to another within the University, see page 42.

ENTRANCE REQUIREMENTS*

Good character and an academic background appropriate for the program of studies contemplated are required.

THE JUNIOR COLLEGE

Admission is based on the following factors:

1. An acceptable certificate of graduation from an accredited secondary school, showing at least fifteen "units"†
2. The principal's statement that the applicant is prepared to undertake college work
3. Scores on the Scholastic Aptitude Test of the College Entrance Examination Board. (See pages 9 and 10.)

The qualifications of applicants, who because of unusual circumstances, do not meet the above requirements will be considered by the Committee on Admission and Advanced Standing. The Committee may prescribe appropriate tests.

Distribution of Units for All Curricula.—Graduation from an accredited high school is accepted in lieu of any prescribed distribution of units. It is to be noted, however, that certain college courses have high school prerequisites, for example, one unit of algebra is required for college courses in chemistry, mathematics, physics, and statistics; one unit of plane geometry is prerequisite to courses in mathematics and physics. Applicants who do not meet the above mathematics requirements, may take algebra and plane geometry without college credit when they are offered by the Department of Mathematics. For a statement of the foreign language requirements see page 51.

A desirable high school program in preparation for college includes: four years of English, at least two years of one foreign language, two years of natural or physical science with laboratory instruction (exclusive of "General Sciences"), two or three years of social studies (with concentration on history), one or two years of basic mathematics.

COLUMBIAN COLLEGE (THE SENIOR COLLEGE)

FOR THE BACHELOR'S DEGREES

Bachelor of Arts.—An Associate in Arts degree based on the *Arts and Letters* curriculum in the Junior College, or the equivalent (see pages 51 and 52).

Bachelor of Science.—An Associate in Arts degree based on the *Science* curriculum in the Junior College, or the equivalent (see page 52).

Bachelor of Science in Medical Technology.—An Associate in Arts degree based on the *Science* curriculum in the Junior College including Chemistry 11-12, Zoology 1-2, and Microbiology 112, or the equivalent (see pages 52 and 53).

* Entrance requirements are established by the faculties of the several colleges, schools, and divisions. The Director of Admissions, as agent for the faculties, administers regulations governing admission, re-admission, and transfer.

† A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

FOR THE MASTER'S DEGREES

An approved Bachelor's degree from an accredited higher institution; an appropriate distribution of courses; and a superior quality of work in the major field are required. A student from an unaccredited institution may be admitted at the discretion of the Committee on Admission and Advanced Standing, but he may be required to take extra work.

Applications for admission must be approved by the department and by the Dean.

Master of Arts.—A Bachelor of Arts degree at this University with a major in the chosen field, or the equivalent.

Master of Science.—A Bachelor of Science degree at this University with a major in the chosen field, or the equivalent.

Master of Fine Arts (1) *in the field of Painting or Sculpture.*—A Bachelor of Arts degree at this University with a major in drawing and painting, sculpture, or commercial art, or the equivalent. (2) *In the field of Dramatic Art.*—A Bachelor's degree from an accredited college or university. Desirable undergraduate background includes courses in literature, drama, and the theater. Applicants with academic deficiencies may be enrolled in the program subject to the satisfactory completion of prescribed courses.

THE GRADUATE COUNCIL

Doctor of Philosophy.—Acceptable personal qualities and the capacity for creative work are required, together with a Bachelor's degree with a major in the proposed field or the equivalent, for provisional status; or one year of acceptable graduate work, for full status.

THE SCHOOL OF MEDICINE

Doctor of Medicine.—Well-qualified candidates are eligible for admission after completing 90 semester hours, or the equivalent, applicable toward a degree in an approved college. However, the majority of applicants are better prepared for the study of medicine after four years of college work. Applicants are required to take the Medical College Admission Test, sponsored by the Association of American Medical Colleges, in advance of the year for which application is made. Specific required courses are:

Chemistry:

| | |
|--|-----|
| Inorganic (including 4 hours of laboratory)..... | 8 |
| Qualitative analysis may be counted as part of this requirement. | |
| Organic (including laboratory)..... | 6-8 |
| The equivalent of a one-year college course | |
| Biology (including 4 hours of laboratory)..... | 8 |
| A course in either general biology or zoology | |
| Physics (including at least 2 hours of laboratory)..... | 8 |
| English Composition and Literature..... | 6 |

Except for these requirements applicants are urged to follow personal interest in developing their premedical courses of study. A well-balanced program, rather than a specific field, is the criterion by which an applicant is judged. It is not advisable to take courses that appear to cover subject matter in the medical program.

ADVANCED STANDING

A student who has satisfactorily completed one or two years at any other medical school approved by the Association of American Medical Colleges and the American Medical Association, and who has the necessary preliminary educational requirements, may apply for advanced standing. Before final admission to the third-year

class, the applicant must have passed Part I examination of the National Board of Medical Examiners.

SELECTION PROCEDURES

The Committee on Admissions is guided in the selection of students by the applicant's academic ability, the results of the Medical College Admission Test, and personal qualifications as determined by letters of reference and personal interview. Applicants are interviewed only by invitation of the Committee.

Each applicant is notified as soon as possible after the Committee makes a decision.

An applicant who is offered a place in a class must notify the Director of Admissions, within two weeks, of his intent to accept the place reserved for him and must remit a deposit of \$100 not later than January 15th prior to the opening of classes of the academic year for which he applied. This deposit will not be refunded after January 15th. It will be credited toward the tuition for the first semester.

Forms for a report on physical condition accompany the offer of a place in class. This report must be completed and returned to the Director of Admissions by the applicant's physician within two months of receipt of the letter of acceptance.

THE LAW SCHOOL

FOR THE DEGREE OF BACHELOR OF LAWS

Bachelor of Laws.—An approved Bachelor of Arts or equivalent degree from an accredited college or university; a satisfactory quality of work; and an acceptable distribution of courses are required. Eligibility is based on personal and scholastic records and on the result of the legal aptitude test. No applicant will be accepted who is ineligible to return in good standing to a previously attended law school. From the applicants, a selection will be made by the Committee on Admissions.

Information concerning the legal aptitude test may be obtained from the Dean of the Law School or from the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

ADVANCED STANDING

Advanced standing toward the degree of Bachelor of Laws is granted only for work successfully completed in other law schools which are members of the Association of American Law Schools. Transferred credits will not be recognized in excess of those which might be earned in a similar period in this Law School.

Advanced standing will not be granted for law work already counted toward the Bachelor of Arts or other pre-legal degree.

Advanced standing will not be granted toward meeting the requirements for the degree of Master of Laws.

FOR THE GRADUATE DEGREES

*Master of Laws.**—A Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree from a member

* One half of the work necessary for graduation from an approved college or university completed prior to entry into military service may be accepted as satisfying the admission requirement for pre-legal work, provided the applicant completed not less than twenty months of continuous service in the armed forces of the United States during World War II and prior to the beginning of the 1948-49 fall semester.

school of the Association of American Law Schools are required. A *B* average on all work toward the degree of Bachelor of Laws is required except in the case of applicants whose experience and attainment are accepted by the Committee on Graduate Studies as an alternative. Advanced standing is not granted for credits earned while a candidate for the first degree in law. Credits earned as an unclassified student are not applied toward this degree unless so specified in the letter of admission.

Master of Comparative Law and Master of Comparative Law (American Practice).—The following are required: (1) the successful completion of and graduation from a course in arts, philosophy, letters, or sciences, equivalent to graduation from a gymnasium, lycée, or liceo; and (2) graduation in law from a recognized foreign university where training was in Civil Law.

Doctor of Juridical Science.—The following are required: a Bachelor of Arts or equivalent degree from an approved college or university; a Bachelor of Laws or equivalent degree, earned with high rank, from a member school of the Association of American Law Schools; and outstanding capacity for scholarly work in the field of law.

UNCLASSIFIED STUDENTS

A degree candidate in good standing at another law school which is a member of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student to earn credits for transfer to the other law school.

A member of the bar or a person, not a member of the bar, who is a graduate of a member school of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student.

Unclassified students participate in the work of the course and take examinations. Courses taken by unclassified students are not credited toward degrees at this Law School.

CONTINUING LEGAL EDUCATION STUDENTS

A simplified admission and registration procedure is used for members of the bar who wish to take courses on a noncredit basis. Continuing Legal Education students may not participate in student activities or benefit from the medical privileges of the University.

THE SCHOOL OF ENGINEERING

Good character and an academic background appropriate for the program of studies contemplated are required.

FOR UNDERGRADUATE STUDY

For the Engineering Technologist Certificate and Degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of Science in Engineering.—Admission is based on the following factors:

1. An acceptable certificate of graduation from an accredited high school showing at least fifteen "units"*
2. The principal's statement that the applicant is prepared to undertake college work
3. Scores on the Scholastic Aptitude Test of the College Entrance Examination Board. (For details, see pages 9 and 10.)

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

The qualifications of applicants who, because of unusual circumstances, do not meet the above requirements will be considered by the Committee on Admission and Advanced Standing. The Committee may prescribe admission tests.

Nine and one-half of the fifteen units required for entrance must be distributed as follows: three in English, two in algebra, one in plane geometry, one-half in plane trigonometry, one in physics or chemistry, and two in one foreign language or history. Although not required, one-half unit of solid geometry and both physics and chemistry are strongly recommended. A graduate of an approved high school who does not offer for admission the particular subjects required for the engineering curriculum, but who does present not less than fifteen acceptable units, may be admitted on condition, if such deficiency in the distribution of units does not exceed two units.

ADVANCED STANDING

Credit for Advanced Placement Examinations

Advanced standing may be granted for study at the collegiate level in advanced courses in an approved secondary school, if substantiated by satisfactory performance in the Advanced College Placement Examination. Arrangement for the examination is the responsibility of the applicant and should be made with the College Board Advanced Placement Examinations, Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

The applicant must request the examining service to submit the test papers and scores to the Office of Admissions. Consideration is given to both the quality of performance on the examination and the quality and content of the course of study completed by the applicant.

Total credit that may be so granted is ordinarily limited to 15 semester hours, not more than 8 semester hours of which may be in any one examination area. In exceptional cases these limits may be exceeded, but in no case will the credit granted exceed 30 semester hours.

Credit from Higher Institutions

Advanced standing may be granted for work successfully completed at accredited institutions of higher learning. Credit will be granted for transferred work only when it meets the requirements for the degree sought at this University, and subject to the general University regulations concerning satisfactory subsequent work.

FOR GRADUATE STUDY

Master of Engineering Administration and Master of Science in Engineering.—For admission to graduate study the student must have a Bachelor's degree from a recognized institution and he must satisfy the Committee on Graduate Studies of his capacity for productive work in the field selected.

Applicants who have significant deficiencies in their preparation may qualify for admission to graduate study by taking prescribed undergraduate courses.

In some cases such study may be carried on in addition to a limited graduate program. In no case may the undergraduate courses fulfill any part of the requirements for the graduate degree.

FOR DEGREE CANDIDACY

Application for admission to candidacy for a Master's degree must be made in writing to the Committee on Graduate Studies. To be accepted the applicant must

have (1) been accepted for graduate study, (2) satisfactorily completed 9 semester hours of graduate courses, and (3) give evidence of satisfactory personal and intellectual qualifications. In exceptional cases the requirement of 9 semester hours of graduate courses may be reduced.

Doctor of Science.—For admission the student must have adequate preparation for advanced study, including a satisfactory Master's degree, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship. The applicant must have capabilities and interests beyond the ability to assimilate organized materials in formal courses of instruction. Originality of mind combined with balanced judgment and accuracy in observation or experiment are necessary to the successful applicant.

THE SCHOOL OF PHARMACY

FOR THE BACHELOR'S DEGREE

Bachelor of Science in Pharmacy.—An Associate in Arts degree based on the curriculum in Pharmacy in the Junior College (see page 53), or the equivalent.

A student who has a Bachelor's degree from an accredited institution or who has completed work in the general cultural or foundational subjects of the pharmacy curriculum may be admitted to advanced standing. No more than one year of advanced standing will be granted a student from any institution other than an accredited college of pharmacy.

FOR THE MASTER'S DEGREE

Master of Science in Pharmacy.—A Bachelor of Science degree from an accredited institution is required. A superior record and professional promise are essential.

THE SCHOOL OF EDUCATION

FOR THE BACHELOR'S DEGREES

Bachelor of Arts in Education, Bachelor of Science in Home Economics, Bachelor of Science in Physical Education.—An Associate in Arts degree based on the Education, Home Economics, or Physical Education curriculum in the Junior College (see pages 53-55); the equivalent from another accredited higher institution; or a certificate of graduation from an approved normal school or the equivalent is required. With the exception of Home Economics, applicants must have personality traits that give promise of success as a teacher.

FOR THE MASTER'S DEGREE

Master of Arts in Education.—To be admitted to candidacy for this degree the applicant must: (1) hold a Bachelor's degree from an accredited institution; (2) have an undergraduate quality-point index of 2.50 or above (C+ average); (3) have demonstrated a genuine interest in teaching; (4) have personality traits that give promise of better-than-average success as a teacher.

To be admitted to candidacy in programs designed to prepare for service in guidance and administration two years of successful teaching experience are required.

FOR THE ADVANCED PROFESSIONAL CERTIFICATE

Advanced Professional Certificate.—The degree of Bachelor of Arts in Education or the degree of Bachelor of Science in Physical Education from the School of Education, or the equivalent from another institution of higher learning; a Master's

degree from an accredited institution of higher learning; at least two years of successful teaching experience; and a permanent teaching or administrative license.

FOR THE DOCTOR'S DEGREE

Doctor of Education.—The degree of Master of Arts in Education, or the equivalent, and at least three years of satisfactory educational experience.

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS

FOR THE BACHELOR'S DEGREES

Bachelor of Arts in Government.—An Associate in Arts degree based on the *International Affairs and Public Affairs* curriculum in the Junior College, or the equivalent, is required. (See page 55.)

Bachelor of Business Administration.—An Associate in Arts degree based on the *Accounting and Business Administration*, or *Business and Economic Statistics* curriculum in the Junior College, or the equivalent, is required. (See pages 55 and 56.)

FOR THE MASTER'S DEGREES

A Bachelor's degree from an accredited college or university is required. A student from an unaccredited institution may be admitted at the discretion of the Committee on Admission and Advanced Standing, but may be required to take work above the minimum requirements.

Students admitted to candidacy must have attained a quality-point index of 3.00 (a B average) in the undergraduate major.

Master of Arts in Government

In the field of International Affairs or Public Affairs.—The applicant's undergraduate program must have included background courses corresponding to an undergraduate major at this University.

In the field of Public Administration.—An undergraduate major in a social science or equivalent work experience.

In the field of Personnel Administration.—An undergraduate major in a social science or education, with appropriate courses in psychology.

In the field of Economic Policy.—An undergraduate major in economics at this University, or the equivalent.

Master of Business Administration

In the field of Accounting or Business and Economic Statistics.—The applicant's undergraduate program must have included background courses corresponding to an undergraduate major at this University.

In the field of Business Administration.—(1) In general business administration: a Bachelor of Business Administration degree at this University, or the equivalent, is required. Applicants who are deficient in such course work may be admitted and will be required to make up deficiencies over and above the normal Master of Business Administration program. (2) In the field of Hospital Administration: a Bachelor's degree from an accredited college or university is required. While a 3.00 average in the undergraduate major is expected, in the selection of candidates consideration will be given to personal qualifications, aptitude for hospital administration, and practical experience.

In the field of Personnel Administration.—An undergraduate major in a social science or education, with appropriate courses in psychology.

FOR THE DOCTOR'S DEGREE

Doctor of Business Administration.—A Master's degree in Business Administration or a related field, or the equivalent, and proficiency in statistics and accounting to the satisfaction of the Committee on Doctoral Studies are required.

THE COLLEGE OF GENERAL STUDIES

For information concerning the College of General Studies see pages 147-51.

THE DIVISION OF UNIVERSITY STUDENTS

Students 21 years of age or over who are not interested in working for a degree in this University may be considered for admission to the Division of University Students to take courses for which they have adequate preparation, as evidenced by previous scholastic records.

Students under 21 years of age who meet the entrance requirements of the Junior College but who are not seeking degree candidacy at this University may be admitted to the Division of University Students to pursue programs of study approved by the Dean.

If a student currently or previously registered in the Division of University Students applies for admission to degree candidacy, a maximum of 45 semester hours of credit will be considered for assignment, in so far as these credits are appropriate toward the degree sought.

In special instances, with the permission of the instructor, a person may be considered for admission as an auditor in a class without being required to take active part in the exercises or to pass examinations, but no credit will be allowed for such attendance.

THE DIVISION OF SPECIAL STUDENTS

This is a nondegree-granting division of the University in which the Director of Admissions may authorize the placement of students in the process of making up entrance deficiencies to degree-granting colleges and schools of the University.

Complete credentials must be submitted and evaluated before a tentative or definite plan of make-up may be prepared.

THE DIVISION OF AIR SCIENCE

The applicant must be a regularly enrolled, full-time, student; at least fourteen years of age; a citizen of the United States; physically fit; of good character; and a candidate for a Bachelor's degree.

CLASSIFICATION OF STUDENTS

Regular Students.—Regular students are those who have met the entrance requirements for candidacy and are registered for degrees.

University Students.—Persons not seeking degrees, as specified in the rules of the Division of University Students, may be admitted to this Division to pursue courses for which they have had adequate preparation.

Special Students.—Special students are those who are in the process of qualifying for admission to curricula in degree-granting colleges and schools of this University.

Additional information concerning curricula, courses offered, entrance requirements, or admission procedure may be obtained from the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D. C.; telephone—FEderal 8-0250, extension 344.

REGISTRATION

A student cannot register for classes until he has received a letter of admission to the University, issued by the Office of the Director of Admissions (see "Admission", pages 9-18).

A student who has previously matriculated in the University, but who has not been in attendance during the semester prior to registration (Summer Sessions excluded), should file an application for readmission in the Office of Admissions (see pages 10 and 11) **two weeks in advance of registration.**

No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in The George Washington University and another institution without the prior permission of the dean of the college, school, or division in which he is registered in this University. Registration in more than one college, school, or division of the University requires the written permission of the deans concerned, *prior to registration*. Allowance of credit for work done concurrently will be at the discretion of the appropriate Committee on Admission and Advanced Standing.

TIME AND PLACE OF REGISTRATION

Registration for all colleges, schools, and divisions except as listed below is conducted in Building C, 2029 G Street NW., during the following periods: *fall semester*, September 21 and 22, 10:00 A.M. to 8:00 P.M.; September 23, 10:00 A.M. to 1:00 P.M. *Spring semester*, February 1 and 2, 10:00 A.M. to 8:00 P.M., February 3, 10:00 A.M. to 1:00 P.M.

For the Law School: Stockton Hall, 720 Twentieth Street NW., days and hours as listed above.

For the School of Engineering: Tompkins Hall, 725 Twenty-third Street NW., undergraduate: days and hours as listed above. For graduate students: *fall semester*—September 19 and 20; *spring semester*—January 30 and 31, 11:00 A.M. to 8:00 P.M.

For the School of Medicine, School of Medicine, 1335 H Street NW., September 14, 10:00 A.M. to 4:00 P.M.

For the College of General Studies: at times and places designated in individual course announcements.

REGISTRATION CHANGES AND WITHDRAWALS

For regulations governing changes in registrations and withdrawals, see pages 21, 22-23, 41-42.

FEES AND FINANCIAL REGULATIONS

By authorization of the Board of Trustees, the following fees have been adopted, effective September 1, 1961:

TUITION FEES

Except for students registered in the Law School, the School of Engineering, the College of General Studies Off-Campus Division, for work toward a Master's Degree in Engineering, and for work leading to a Doctor's degree:

| | |
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| Full-time program (15 hours or more): for each semester..... | \$450.00 |
| Part-time program: | |
| For each semester hour for which the student registers..... | 30.00 |
| For each semester hour for which the student registers for courses in Departments of Instruction in the School of Engineering..... | 35.00 |
| In the School of Engineering: | |
| Full-time program (15 hours or more): for each semester..... | 500.00 |
| Part-time program: | |
| For each semester hour for which the student registers..... | 35.00 |
| For each semester hour for which the student registers for courses in Departments of Instruction other than in the School of Engineering.. | 30.00 |
| In the Law School: | |
| Full-time program (12 hours or more): for each semester..... | 400.00 |
| Part-time program: for each semester hour for which the student registers | 30.00 |
| For the degree of Doctor of Medicine, for two semesters†..... | 1,200.00 |
| For the degree of Doctor of Philosophy‡, Doctor of Education, or Doctor of Business Administration: | |
| For work§ leading to and including the Council Fellowship or General examination\|\| ..... | 1,000.00 |
| For work leading to and including the final examination\|\|..... | 1,000.00 |
| For the degree of Doctor of Juridical Science: | |
| For work leading to and including the final examination\|\|..... | 1,000.00 |
| For the Master's degrees in Engineering: | |
| For work leading to and including the Comprehensive Examination\|\|..... | 900.00 |
| For the degree of Doctor of Science: | |
| For work leading to and including the Qualifying Examination..... | 1,200.00 |
| For work leading to and including the final examination..... | 1,200.00 |

ADDITIONAL COURSE FEES

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in three payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

GRADUATION FEES

| | |
|--|-------|
| Wherein the degree of Associate in Arts or Associate in Science is granted.. | 10.00 |
| Wherein the Engineering Technologist Certificate is granted..... | 10.00 |

* Payment of tuition for a Master's thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered "in residence" during this period. If the preparation of the thesis extends beyond the second academic year, it must be registered for again, and tuition paid on the same basis as for a repeated course.

† Registration in the School of Medicine is for a period of two semesters. After the student has entered the course of instruction he is obligated for the full tuition for two semesters. No part of the tuition will be refunded upon withdrawal or dismissal for any cause.

‡ The tuition fee is to be paid in two years at the rate of \$250 a semester or in full at the time of registration. No residence fee will be charged if a third year is needed for completion of either part of the degree requirements.

§ This fee does not cover the cost of tuition for elementary courses (numbered 1 to 100).

|| When a limited schedule is carried which extends the time of completion of the program of study to more than one year, the proportionate part of the charge may be fixed by the Treasurer.

| | |
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| Wherein a degree other than the Associate in Arts or Associate in Science degree is granted..... | 25.00 |
| Wherein an Advanced Professional Certificate in Education is granted..... | 25.00 |
| FEE FOR BINDING MASTER'S THESIS..... | 6.00 |
| FEE FOR PRINTING SUMMARY OF DOCTORAL DISSERTATION..... | 85.00 |
| SPECIAL FEES | |
| Application fee, charged each applicant for admission as a degree candidate, nonrefundable | 10.00 |
| Application fee, charged each applicant for admission as a nondegree candidate, nonrefundable | 5.00 |
| Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable..... | 5.00 |
| Admission tests (when required)..... | 6.00-12.00 |
| Graduate Record Examination fee (to cover two examinations), charged each candidate for a Bachelor's degree in Columbian College; the School of Engineering; the School of Government, Business, and International Affairs; or the College of General Studies at the time of registration for the final semester of study (excluding summer sessions)..... | 10.00 |
| Late-registration fee, charged each student who fails to register within the designated period | 5.00 |
| Change fee, charged each student for each change in program: dropping or adding a course, changing from one section to another within a course, change of status (from auditor to credit status or vice versa), and change in credit hours for a course..... | 2.00 |
| Withdrawal fee, charged each student who preregisters and withdraws prior to the regular registration..... | 5.00 |
| Service fee, charged each student for late payment of tuition (see "Payment of Fees") | 2.00 |
| Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees..... | 5.00 |
| Residence fee, charged each student granted "leave of absence" status for the academic year in the School of Medicine..... | 50.00 |
| Residence fee, charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements. Due and payable on the official days of registration: | |
| In the Law School†..... | 30.00 |
| In the School of Engineering‡..... | 35.00 |
| In all other colleges, schools, and divisions..... | 30.00 |
| For special physical examination..... | 2.00 |
| Special fee, Law School (Student Bar Association activities, <i>Law Review</i> , and other services), charged each student in the Law School for each semester or any part thereof except the summer term..... | 10.00 |
| Engineers' Council fee, charged each student in the School of Engineering for each semester or any part thereof except the summer term..... | 1.50 |
| For each examination to qualify for advanced standing and for each special examination | 5.00 |
| Laboratory checkout fee, charged each student in chemistry and pharmacy courses who fails to check out of the laboratory by the time set by the instructor | 3.00 |
| Transcript fee, charged for each transcript of record after the first..... | 1.00 |

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library; (4) gymnasium

* Payable at the time of application for transfer or readmission.

† Payment of the residence fee entitles the student who is granted leave of absence to return and continue his work toward a degree under the requirements which were in force at the time of his first registration but does not count as part of the residence requirement for the degree.

‡ Candidates for the Master's degrees in the School of Engineering who have paid in full the fee for work leading to and including the Comprehensive Examination but whose Comprehensive Examinations have not been completed will be granted one semester without payment of residence fee.

privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to the *University Hatchet*, the student newspaper; (7) admission to University debates; (8) medical attention and hospital services as described under Health Administration. These privileges, with the exception of the issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each semester are due and payable in advance at the time of registration.

With the approval of the Treasurer, the student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day* in November; one-third on the first working day* in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

Arrangements for the above may be made with the Office of the Cashier at the time of registration. Installment-due notices are mailed. However, nonreceipt of notice is no excuse for failure to meet obligations when due.

A student who fails to meet payments when due, but who pays his fees within the following two weeks of the date on which payment is due, is charged a service fee of \$2. A student who fails to meet payments within these two weeks after payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of \$5.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

Applications for withdrawal from the University or for change in class schedule must be made in person or in writing to the dean of the college, school, or division in which the student is registered. Notification to an instructor is not an acceptable notice (see "Withdrawal", page 41).

In authorized withdrawals and changes in schedule, financial adjustments will be made as follows:

FALL SEMESTER

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of tuition charges.

SPRING SEMESTER

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of tuition charges.

No refund or reduction will be allowed on any withdrawal dated after the last working day* in November (fall semester) or March (spring semester).

* The University work week is Monday through Friday, inclusive.

A student enrolled in a full-time program, who drops or adds a course and continues to be in a full-time program, will have no financial adjustments of tuition made other than those involving course fees.

In no case will a refund be made of the first third of the total tuition charges unless the registration is in advance and is cancelled before the regular registration day. In this case a withdrawal fee of \$5 is charged and tuition fees refunded. In no case will tuition be reduced or refund because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this be credited to another semester.

Any student in chemistry or pharmacy who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a checkout fee in the amount of \$3. A student who drops a course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Any student enrolled in the Air Force ROTC who fails to turn in uniforms, equipment, and textbooks, on separation from the Corps, will be charged the value of the missing items.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

FELLOWSHIPS, SCHOLARSHIPS, PRIZES, FINANCIAL AID

FELLOWSHIPS, GRADUATE SCHOLARSHIPS, AND ASSISTANTSHIPS

The following fellowships, graduate scholarships, and assistantships are available. Unless otherwise specified, applications should be submitted not later than April 1 preceding the period for which the award is to be made. They should be directed to the executive officer of the department or school concerned and addressed to The George Washington University, Washington 6, D. C.

University Teaching Fellowships.—These are assigned for the academic year to the various departments of instruction. The applicant is expected to be a prospective candidate for a Doctoral degree in the general field of his future doctoral study. Each teaching fellow receives an annual stipend (on a nine-month basis) of up to \$1,700 plus full tuition and laboratory fees for whatever schedule of study or research his fellowship duties permit him to carry. Stipends vary with the work load of the individual teaching fellow. Normally a University teaching fellow renders half-time service in classroom or laboratory assignments to the department of instruction directing his doctoral study. Application should be made to the executive officer of the department of instruction concerned.

Graduate Teaching Assistantships.—These are open in various departments of instruction to candidates for the Master's degrees. Each graduate teaching assistant renders a designated unit of service to his major department of instruction, and receives, depending upon his teaching or laboratory assignment, up to \$1,700 on a nine-month basis plus tuition and laboratory fees for the program of studies which the duties of his assistantship permit him to carry. Application should be made to the executive officer of the department of instruction concerned.

Law School Research Assistantships.—Student research assistantships are available each year to students currently enrolled in the Law School, preference being given to applicants who are completing their second year. Each assistant receives an annual stipend. Awards are made on the basis of academic standing, financial need, and capacity for leadership. Research assistants have duties similar to those

of teaching fellows. Applications should be submitted to the Dean of the Law School not later than May 1.

Law School Teaching Fellowships.—Teaching fellowships are available each year in the Law School to prospective candidates for the Master of Laws degree. Each fellow receives an annual stipend, plus tuition for the academic year. Teaching fellows follow an approved program of study and research, assist members of the Faculty in the guidance of first-year students, and supervise student work in legal bibliography and the drafting of legal instruments. Upon satisfactory completion of the year's work, a fellow is recommended for the degree of Master of Laws. Applications should be submitted to the Dean of the Law School not later than April 1.

American Security and Trust Company Fellowship.—One two-year fellowship in the amount of \$2,000 a year, established in 1960 by the American Security and Trust Company, is available to a graduate student in business administration or economics in the School of Government, Business, and International Affairs.

Frederick Albert and Alma Hand Britten Scholarships.—These scholarships, established in 1959 by bequest of Alma Hand Britten, are awarded to incoming graduate students, on the basis of need and scholarship, who would not otherwise be able to pursue their studies in the School of Engineering. Married students are eligible. Application should be made before March 1 for the following academic year. Application forms are available in the Office of the Dean of the School of Engineering.

Isabella Osborn King Research Fellowships.—Fellowships varying in amount from \$750 to \$3,000, established in 1927 by bequest of Mrs. Isabella Osborn King, are offered in the biological sciences and are intended to foster research for which the libraries and scientific establishments in Washington provide special facilities.

Law School Scholarships.—Scholarships are available each year in the Law School to graduates of accredited colleges. Each scholarship provides full three-year tuition in the morning division of the Law School. Candidates must have graduated in the upper fifth of their class and must have demonstrated qualities of leadership in addition to scholastic attainment. To retain the scholarship, the successful candidate must maintain a *B* average. Application must be made before March 1 to the Dean of the Law School.

Robin Miller Research Fellowship.—A fellowship in medicine in the amount of \$1,800, established in 1953 by bequest of Mrs. Robin Miller, is offered for the study of cardiovascular diseases.

National Defense Graduate Fellowships.—Under the National Defense Education Act, fellowships are available at this University in Germanic Languages and Literatures and in Romance Languages and Literatures at \$2,000 (with an increase of \$200 each for the second and third years) plus \$400 a year for each dependent; tuition is waived. Application should be made to the Graduate Council.

National Science Foundation Cooperative Graduate Fellowships.—These fellowships at \$2,200 for twelve months or \$1,600 for nine months, with tuition waived, are available in the mathematical, physical, medical, biological, and engineering sciences and in certain other fields regarded as employing scientific methods.

National Science Foundation Summer Fellowships for Graduate Teaching Assistants.—These summer fellowships are available at not less than \$50 or more than \$75 a week for a period of 8 to 12 weeks; tuition is waived. Application should be made to the Graduate Council.

Thomas Bradford Sanders Fellowships.—Fellowships varying in amount from \$900 to \$1,500 plus tuition, established in 1928 by bequest of Miss Addie Sanders

in memory of her brother, Thomas Bradford Sanders, are offered in various departments of science.

Scottish Rite Fellowships.—The Ancient and Accepted Scottish Rite of Freemasonry, Southern Jurisdiction, U.S.A., offers fellowships each in the amount of \$1,800, to graduates of accredited colleges who wish to enroll in the School of Government, Business, and International Affairs, to train for government leadership—federal, state, or local. The territory includes the Orient of Alabama, Alaska, Arizona, Arkansas, California, Colorado, District of Columbia, Florida, Georgia, Hawaii, Idaho, Iowa, Kansas, Kentucky, Louisiana, Maryland, Minnesota, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, Wyoming, Panama, Puerto Rico, and the Bodies of Taiwan, Japan, Okinawa, and Guam.

These fellowships are made possible by annual gifts and are available to residents of the respective states or countries, and application therefore should be made to the Sovereign Grand Inspector General of the Supreme Council, 33°, of the Southern Jurisdiction, U.S.A., of the Orient state or country) from which the application is to be made.

Wolcott Foundation Fellowships.—Fellowships sponsored by the Wolcott Foundation of High Twelve International are available to graduates of accredited colleges who wish to enroll in the School of Government, Business, and International Affairs for graduate work in International Affairs, Public Administration, Personnel Administration, or Business Administration. Preference is given to students who themselves are affiliated with, or whose parents are affiliated with, High Twelve International or the Masonic Order. The fellowships cover tuition for one calendar year of graduate study in residence. Where need is shown, a living allowance up to \$100 a month may be granted.

SCHOLARSHIPS

Scholarships are awarded for the academic year unless otherwise specified and are credited in equal parts for each semester. Each holder must carry a full schedule of academic work (fifteen semester hours or in the professional schools, the full prescribed schedule) during the period for which the scholarship is awarded.

Scholarship application should be made in writing on or before April first for the following academic year and, unless otherwise specified, should be addressed to the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D. C. Awards are made during the month of April. All scholarships begin with the fall semester.

OPEN TO INCOMING FRESHMEN

The following scholarships are awarded to outstanding members of graduating classes of accredited secondary schools. Applicants must be citizens of the United States who are not receiving veterans' benefits under any public law.

Applicants must apply for admission to the University and be accepted before their scholarship applications can be considered. Forms for application for admission to the University are available at the Office of the Director of Admissions, The George Washington University, Washington 6, D. C.

Alpha Zeta Omega Scholarship.—This scholarship, in the amount of \$500, was established by Pi Chapter of Alpha Zeta Omega Pharmaceutical Fraternity. It is awarded annually to a member of the graduating class of one of the public high

schools of the District of Columbia, nearby Maryland, or Virginia who intends to enroll in the pharmacy curriculum and complete the requirements for the degree of Bachelor of Science in Pharmacy. Application should be made to the Dean of the School of Pharmacy.

Alumni Scholarships.—Five scholarships are available each year in the Junior College, upon the recommendation of regional alumni clubs, to outstanding men graduating from accredited high schools. The scholarships cover tuition costs for eight semesters (beginning with the fall semester) of full-time work but do not include special fees such as laboratory charges, room, board, or other expenses. To retain the scholarship, the student must maintain a *B* average. Additional information may be obtained from the Director of Alumni Relations.

*Association of Federal Communications Consulting Engineers Scholarship.**—This scholarship, which includes tuition, laboratory fees, and books, established in 1958 by the Association of Federal Communications Consulting Engineers (AFCCE), is available to a student of good character, promise, and leadership pursuing a course of study leading to a Bachelor of Electrical Engineering degree and intending to major in communications.

Frederick Albert and Alma Hand Britten Scholarships.—These scholarships, established in 1959 by bequest of Alma Hand Britten, in amounts to be specified from time to time by the Trustees, are available to needy students desiring to prepare for the engineering profession. Married students are eligible. Application forms are available in the Office of the Dean of the School of Engineering.

Crown Photo Scholarship.—This scholarship, in the amount of \$500, established in 1958 by the Crown Photo Service of Washington, D. C., is to be awarded annually to a member of the graduating class of one of the public high schools of the District of Columbia, nearby Maryland, or Virginia, who intends to enroll in the pharmacy curriculum and complete the requirements for the degree of Bachelor of Science in Pharmacy. Application should be made to the Dean of the School of Pharmacy.

District of Columbia Pharmaceutical Association Scholarship.—This scholarship, in the amount of \$500, was established in 1954. It is awarded annually to a member of the graduating class of one of the public or parochial high schools of the District of Columbia, nearby Maryland, or Virginia who intends to enroll in the pharmacy curriculum and complete the requirements for the degree of Bachelor of Science in Pharmacy. Application should be made to the Dean of the School of Pharmacy.

Estella Constance Drane Scholarship.—This scholarship in the amount of \$200, established in 1957 by bequest of Estella Constance Drane in memory of the boys of the former Washington Business High School who served in World War I, is available annually to a graduate of Roosevelt High School upon the recommendation of the Scholarship and Award Committee of the faculty of Roosevelt High School and the approval of the Committee on Scholarships of The George Washington University.

School of Engineering Scholarships.—Four scholarships are available each year in the School of Engineering to graduates of accredited secondary schools. The holders of these scholarships must carry a full program in the School of Engineering.

Each scholarship is a full-tuition scholarship but does not cover special fees. Each scholarship is for four academic years (summer work is not to be included), pro-

* This scholarship is renewable and is, therefore, not available each year for award to an incoming freshman.

vided the holder thereof meets all academic and other standards of the University.

To retain a School of Engineering scholarship, an average of *B* and a satisfactory standard of deportment must be maintained.

Application should be made before March 1 for the following academic year. Application forms are available in the Office of the Dean of the School of Engineering.

General Motors College Scholarship.—This scholarship, established in 1955 by General Motors Corporation, is available for an incoming freshman student who is a citizen of the United States and demonstrates outstanding talent, high personal qualifications, and financial need. The amount of the award has been made flexible and will range from an honorary award of \$200, up to an award of \$2,000 per year, depending upon the demonstrated need of the individual. It is renewable for the four years of undergraduate work provided the student continues to meet the high standards established for the holder of this award.

High School Scholarships.—The Board of Trustees of the University offers thirty-four scholarships to graduates of public high schools in the Washington Metropolitan Area: sixteen in the District of Columbia area; four each in the Montgomery, Prince Georges, Arlington, and Fairfax areas; and two in the Alexandria City area, the home city of General George Washington. Scholarships are divided equally between men and women. One of the District of Columbia Scholarships, designated as the *Amos Kendall Scholarship*, was established in 1869 by the late Honorable Amos Kendall.

Each scholarship is awarded annually to a member of the graduating class who plans to enroll in the Junior College for the freshman and sophomore years and thereafter in Columbian College or any one of the professional schools announcing a preprofessional curriculum in the Junior College. The scholar must register the following September and carry each semester a full academic program as prescribed in the Junior College curricula or in the college or school in which he carries his upper division work; in no case is the scholar permitted to carry less than fifteen semester hours.

Each scholarship is a full-tuition scholarship but does not cover special fees. Each scholarship is for four academic years (summer work is not to be included), provided the holder thereof meets all academic and other standards of the University.

To retain a high school scholarship, an average of *B* and a satisfactory standard of deportment must be maintained. If for any reason a holder of a high school scholarship resigns or is dropped from said scholarship, the scholarship remains unfilled.

Nominations are made by principals and counselors of participating high schools. Inquiries should be addressed to the high school counselor.

High School Discussion Conference Scholarships.—Three scholarships are available each year in the Junior College to high school seniors who participate in The George Washington University High School Discussion Program. These scholarships cover tuition for one year, but do not include laboratory fees or other special fees. For information concerning application, consult the Department of Speech. Nominations are made by principals of participating high schools.

Levin M. Powell Scholarships.—These full tuition scholarships, established by the bequest of Admiral Levin M. Powell in 1886, are available to young men desiring to prepare for entrance into the Naval Academy at Annapolis, Maryland. The number

of scholarships awarded each year will be determined by the income from the endowment.

*Texaco Scholarship.**—This scholarship, established in 1956 by the Texas Company, covers tuition, fees, and textbooks, and is awarded annually to a young man entering the freshman class in a curriculum which will prepare him for a career in the petroleum industry. It is renewable for the four years of undergraduate work provided the student maintains high standards of scholarship and deportment.

FOR STUDENTS WITH ESTABLISHED ACADEMIC RECORDS AT THIS UNIVERSITY

Applicants for these scholarships must have completed one semester of work (15 hours minimum) and maintained a *B* (3.0) average.

American Foundation for Pharmaceutical Education Scholarship.—A scholarship fund, in the amount of \$400, established by the American Foundation for Pharmaceutical Education, is available annually to junior and senior students of the School of Pharmacy who are in the upper quarter of their class or who are maintaining average grades of not less than *B*. The scholarship funds are awarded on the recommendation of the Committee on Scholarship of the School of Pharmacy.

American Society of Women Accountants.—This scholarship, in the amount of \$100, established in 1953 by the District of Columbia Chapter of the American Society of Women Accountants, is available to a sophomore, junior, senior, or post-graduate woman majoring in accounting whose academic record is good and who needs aid in continuing her education.

Byron Andrews Scholarship.—This scholarship, in the amount of \$300, established in 1920 by Mrs. Belle Fisk Andrews in memory of her husband, Byron Andrews, is available "for ambitious and needy students, who desire to pursue courses in English, Latin, journalism, history, literature, or political science".

Anna Bartsch Hospital Intern Scholarship.—This scholarship, in the amount of \$180, established in 1946 by Dr. Anna Bartsch-Dunne as a memorial to her mother, Anna Bartsch, is available to a woman intern in The George Washington University Hospital. Award is made upon the recommendation of the Hospital's Internship Committee.

Anna Bartsch Medical Student Scholarship.—This scholarship, in the amount of \$500, established in 1946 by Dr. Anna Bartsch-Dunne, as a memorial to her mother, Anna Bartsch, is available to a woman in the School of Medicine, "of outstanding scholarship, character, and promise, who intends to make the practice of medicine her life profession". The award is made upon the recommendation of the Faculty of the School of Medicine.

Everett Lamont Bradley Scholarship.—This scholarship, in the amount of \$160, established in 1954 by bequest of Alice R. H. Bradley in memory of her son, Everett Lamont Bradley, is available to a student in the School of Medicine.

Frederick Albert and Alma Hand Britten Scholarships.—These scholarships, established in 1959 by bequest of Alma Hand Britten, in amounts to be specified from time to time by the Trustees, are available to needy full-time graduate or undergraduate students registered in the School of Engineering, who would not otherwise be able to pursue such professional study. Married students are eligible. Application should be made before March 1 for the following academic year. Application forms are available in the Office of the Dean of the School of Engineering.

Emma K. Carr Scholarships.—Four scholarships in the amount of \$400 each and

* This scholarship is renewable and is, therefore, not available each year for award to an incoming freshman.

ten of \$100 each, established in 1932 by Mrs. Emma K. Carr, are available to "young men (of the white race) for undergraduate or postgraduate work, considering character, capacity, and need".

Henry Harding Carter Scholarship.—This scholarship, in the amount of \$500, established in 1896 by Mrs. Maria M. Carter in memory of her husband, Henry Harding Carter, is available to a deserving student who is preparing for the civil engineering profession.

Maria M. Carter Scholarship.—This scholarship, in the amount of \$25, established in 1871 by Mrs. Maria M. Carter, is available to a young man.

Daughters of the American Revolution Scholarship.—This scholarship, in the amount of \$500, established in 1952 by the District of Columbia Daughters of the American Revolution, is available to junior and senior students, preferably women, who are descendants of patriots of the American Revolution.

Isaac Davis Scholarship.—This scholarship, in the amount of \$35, was established in 1869 by the Honorable Isaac Davis of Massachusetts. Nominations for the scholarship may be made "by the founder or his eldest lineal descendant". In case no such nomination is made, the scholarship is to be awarded by the University.

District of Columbia Pharmaceutical Association Women's Auxiliary Scholarship.—This scholarship, in the amount of \$100, was established in 1960. It is awarded annually to a woman student enrolled in the School of Pharmacy or to a woman student who has completed the pre-pharmacy requirement at this University or another institution.

Charles Worthington Dorsey Memorial Scholarship.—This scholarship, established in 1947 as a memorial to Charles Worthington Dorsey, Bachelor of Laws, '81, Master of Laws, '82, is awarded upon the recommendation of the Faculty of the Law School to a needy and promising graduate of Columbian College or other division of the University, with a Bachelor of Arts or other equivalent degree, who has maintained an average of B as an undergraduate student and who desires to pursue the study of law as a full-time student. The scholarship covers tuition for the course leading to the degree of Bachelor of Laws or Juris Doctor, provided that the holder maintains an average of B. The right is reserved to suspend the benefits of the scholarship for cause at any time. This scholarship is awarded ordinarily once every three years.

Henry Parsons Erwin Scholarship.—This scholarship, in the amount of \$300, established in 1955 by Mrs. Helen B. Erwin as a memorial to her husband, Henry Parsons Erwin, a former Trustee of the University, is available for a student in Engineering.

Robert Farnham Scholarship.—This scholarship, in the amount of \$75, given to the University in 1871 by Mrs. Robert Farnham, is available to a student in Columbian College.

Esther Brigham Fisher Scholarship.—This scholarship, in the amount of \$75, established in 1951 by the bequest of Mrs. Esther Brigham Fisher, is available to a student in the University.

Georgetown Business and Professional Women's Club Scholarship.—This scholarship, in the amount of \$100, established in 1958 by the Georgetown Business and Professional Women's Club is available to a woman student in the field of science.

Mildred Green Memorial Scholarship Fund.—The income from this fund of \$3,317, established in 1959 by Alpha Theta Chapter of Pi Lambda Theta, is awarded annually to a student in the School of Education, upon the recommendation of the donor, which is submitted prior to April 1.

Anna Spicker Hampel Scholarship.—This scholarship, in the amount of \$25, estab-

lished in 1949 by Mrs. Evelyn Hampel Young in memory of her mother, Anna Spicker Hampel, is available for scholarship aid to young married women students in the School of Education or Columbian College.

Elma Lewis Harvey Scholarship.—This scholarship of \$175 was founded in 1921 by Mrs. Emma Elizabeth Harvey in memory of her daughter, and is awarded every four years, or as often as vacant, to a young woman in Columbian College of the Protestant faith and the Caucasian race who shall be selected for scholarship and moral qualifications.

Hazelton Scholarship.—This scholarship, in the amount of \$275, established in 1950 by the bequest of Lillie S. Hazelton, is awarded annually "for the use and assistance of needy and worthy students."

Kappa Alpha Theta Scholarship.—This scholarship, in the amount of \$500, established by the Washington alumnae of Kappa Alpha Theta, is available for the training of a clinician in speech correction.

Kappa Kappa Gamma Scholarship.—This scholarship, in the amount of \$500, established in 1959, is awarded to a student planning to follow the profession of speech correction.

Kappa Psi Scholarship.—This scholarship, in the amount of \$150, is made available by Gamma Tau Chapter and the District of Columbia Graduate Chapter of Kappa Psi Pharmaceutical Fraternity. It is awarded annually to a student in the School of Pharmacy who is in need of financial aid.

Law School Scholarships.—Scholarships are available each year to second and third year full-time students in the Law School with *A* or *B* averages. Each scholarship provides tuition for the academic year. Application must be made before July 1 to the Dean of the Law School.

Eugene and Agnes E. Meyer Scholarships.—A scholarship fund, in the amount of \$3,500, established in 1952 by the Eugene and Agnes E. Meyer Foundation, is available annually "to assist promising students or applicants in meeting the costs of furthering their education, with preferential consideration to children of persons who are employed in public service, including service in the armed forces or the judiciary."

A. Morehouse Scholarship.—This scholarship was established by Mr. A. Morehouse in 1861. It carries an annual stipend of \$50, which is available for an undergraduate "intending to enter the Christian ministry."

Newspaper Scholarships.—One scholarship is available each year to a candidate recommended by each of the following newspapers: *The Washington Daily News*, *The Washington Post and Times Herald*, and *The Evening Star*. The holder of the scholarship must be an employee of the newspaper. These scholarships are valid for four academic years, provided the holder continues in the employ and is recommended by the newspaper, and maintains a satisfactory academic record and a high standard of deportment. They cover tuition but do not include laboratory fees, graduation fees, or other special fees.

Panhellenic Association of Washington, D. C., Scholarship.—A scholarship, in the amount of \$300 to be applied to tuition fees, has been established by the Panhellenic Association of Washington, D. C. This scholarship is available annually to a woman student in her sophomore or junior year who is a member of a National Panhellenic Conference sorority, has done the most to promote good social relations among the sororities on the campus, is an outstanding leader in student affairs sponsored by the University, and has a 3.0 (*B*) or better average.

Paul Pearson Scholarship.—This scholarship, in the amount of \$200, established

in 1940 by bequest of Paul Pearson and "to be known as the Dr. Paul Pearson award," is available to a student in the School of Pharmacy, upon the recommendation of the Faculty of that School.

Phi Delta Delta Scholarship.—Zeta Chapter of Phi Delta Delta Legal Fraternity (International) offers annually a scholarship in the amount of \$40 to the woman student in the sophomore class who has excelled in scholastic achievement and service to the Law School in her first year.

Phi Delta Gamma Scholarship.—This scholarship, in the amount of \$100, established in 1956 by Beta Chapter of Phi Delta Gamma, is awarded annually to a woman who is a candidate for an advanced degree at the University.

Lula M. Shepard Scholarships.—Two scholarships, in the amount of \$350 and \$100, respectively, established in 1946 by bequest of Lula M. Shepard, are available to "worthy Protestant students" wishing to enroll in the International Affairs program of the School of Government, Business, and International Affairs.

David Spencer Scholarship.—This scholarship of \$160, established in 1918 by Miss Louisa J. Spencer, is available under certain restrictions.

David Perry Steinman Memorial Scholarship Fund.—The income from this fund of \$3,116, established in 1960 by friends and classmates, is awarded annually to a sophomore in the School of Medicine on the basis of need and academic performance.

Mary Lowell Stone Scholarship.—This memorial scholarship, in the amount of \$150, established in 1893, is available to a woman student of science in Columbian College.

Charles Clinton Swisher Scholarships.—These scholarships, in the amount of \$500 and \$300, respectively, established in 1941 by bequest of Professor Charles Clinton Swisher, are available, under certain conditions, to students of medieval history.

University Hospital Scholarships in Medical Technology.—Ten Scholarships are available, each to cover the cost of 24 semester hours of the 30 in the last year of the curriculum leading to the degree of Bachelor of Science in Medical Technology.

William Walker Scholarship.—This scholarship, established in 1824 by William Walker, Esq., carries an annual stipend of \$50, and is available for an undergraduate intending to enter the Christian ministry.

John Withington Scholarship.—This scholarship of \$100, was established in 1830 by the New York Baptist Theological Seminary.

Ellen Woodhull Scholarship.—This scholarship of \$40, established by Ellen M. E. Woodhull, is available to a student in Columbian College.

The Zonta Club of Washington, D. C., Scholarship.—This scholarship, in the amount of \$400, offered by the Zonta Club of Washington, D. C., is available to a woman who is a junior, senior, or graduate student with special interest in a professional or business career.

THE COLUMBIAN WOMEN SCHOLARSHIP FUNDS

The Columbian Women Scholarships are awarded to women students on the basis of financial need and scholastic attainment. Applications for these scholarships should be addressed to the Chairman of the Scholarship Committee, The Columbian Women, The George Washington University, Washington 6, D. C., not later than May 15 for the fall semester, and not later than January 1 for the spring semester. These scholarships are awarded from income of the following endowments:

Nellie Maynard Knapp Scholarship Fund.—Established by a gift of \$5,000 in 1915 in memory of a former president, Nellie Maynard Knapp.

Founders of Columbian Women Scholarship Fund.—A fund of \$5,000 created in 1920.

Lillian Young Herron Scholarship Fund.—A fund of \$5,000 created in 1925 and named in 1930 in memory of a former president.

Elizabeth V. Brown Scholarship Fund.—A fund of \$1,200 created in 1925 by the College Women's Club of Washington, D. C., in memory of Elizabeth V. Brown. This scholarship is restricted to the School of Education.

College Women's Scholarship Fund.—A gift of \$500 in 1926 by the College Women's Club of Washington.

Lewes D. and Myrtie H. Wilson Memorial Scholarship Fund.—A gift of \$1,000 in 1926 by Elizabeth Wilson as a memorial to her parents, Lewes D. and Myrtie H. Wilson. This scholarship is restricted to the School of Medicine.

Grace Ross Chamberlin Scholarship Fund.—A fund of \$2,300 created in 1932 in honor of Grace Ross Chamberlin, a former president.

Janet McWilliams Scholarship Fund.—A fund of \$1,000 established in 1954 by the bequest of Janet McWilliams, a former president.

Rose Lees Hardy Foundation Scholarship Fund.—A fund of \$2,000 created in 1957 in memory of Rose Lees Hardy, an alumna of the University.

Victoria Briggs Scholarship Fund.—A fund of \$500 established in 1959 by the bequest of Victoria Briggs Turner.

PRIZES

Alpha Chi Sigma Prizes.—Alpha Pi Chapter of Alpha Chi Sigma Fraternity offers annually the following prizes:

A *Handbook on Chemistry and Physics* is awarded to each of the three students who carry at least eighteen semester hours during the freshman year and attain the highest averages in freshman chemistry.

The name and year of graduation of the student who has attained the highest quality-point index in courses in chemistry will be inscribed on a bronze plaque. The winner must have had at least sixteen hours of chemistry including the final semester at The George Washington University.

Alpha Delta Pi Prize.—Alpha Pi Chapter of Alpha Delta Pi Fraternity offers an annual prize of \$10 to the woman member of the junior class with the most outstanding record in scholarship, extracurricular activities, and service to the University.

Alpha Kappa Psi Prize.—Beta Mu Chapter of Alpha Kappa Psi Fraternity awards annually a key to the male student who has completed ninety semester hours at The George Washington University and has attained the highest average grade in economics, business administration, public accounting, public finance, and foreign commerce. The name of the winner and the year of the award will be engraved on a plaque in the office of the Dean of the School of Government, Business, and International Affairs.

Alpha Zeta Omega Prize.—The Ladies' Auxiliary, Pi Chapter, of the Alpha Zeta Omega Pharmaceutical Fraternity offers annually a copy of *The United States Dispensatory* to the student who has completed at least fifteen semester hours in the School of Pharmacy and who has attained the highest average in his courses.

American Institute of Chemists Prize.—The District of Columbia Chapter of the American Institute of Chemists offers an annual prize of a medal and a one-year subscription to *The Chemist* to that graduating student, majoring in chemistry, who excels in scholarship and in the personal qualities of integrity and leadership.

American Pharmaceutical Association Prize.—The City of Washington Branch of the American Pharmaceutical Association offers annually an award of \$25 to be applied on an active membership in the American Pharmaceutical Association. It is awarded to the student completing the next-to-last year in the School of Pharmacy who has maintained a high scholastic average and who has contributed most to the student activities of the School.

Normal B. Ames Memorial Award.—This prize, established in 1960 in memory of Dr. Norman B. Ames by many of his friends, is to be awarded annually to a member of the graduating class of the School of Engineering whose class standing is in the upper 25th percentile and who has an outstanding record for participation in extracurricular activities of the University.

Byrne Thurtell Burns Memorial Prize.—This prize of \$55 is awarded to the senior majoring in chemistry who shows the greatest proficiency in organic chemistry, as evidenced by a comprehensive examination, and who possesses such qualifications of mind, character, and personality as to give promise of future achievement.

Martin L. Cannon Memorial Prize.—Pi Chapter of the Alpha Zeta Omega Pharmaceutical Fraternity offers annually a copy of *The United States Dispensatory*, in memory of Dr. Martin L. Cannon, to the student in pre-pharmacy receiving his Associate in Arts degree, who throughout his course has obtained the highest grades in his courses.

Chi Omega Prize.—Phi Alpha Chapter of Chi Omega Fraternity offers annually a prize of \$25 to be awarded to the woman student in the graduating class with the highest record in the following social sciences: economics, sociology, political science, and history; combined with general excellence.

John Henry Cowles Prizes.—These prizes, founded in 1943 by John H. Cowles, Grand Commander of the Supreme Council of the Thirty-third Degree (Mother Council of the World) of the Ancient and Accepted Scottish Rite of Freemasonry, Southern Jurisdiction of the United States of America, are awarded annually to the best two scholars in the senior class of the School of Government, Business, and International Affairs. The prizes are as follows: first prize, \$100; second prize, \$65.

DeWitt Clinton Croissant Prize.—This prize of \$50, established by the late Professor DeWitt Clinton Croissant, is awarded annually to the undergraduate student who as a member of one of the University courses in drama, or as a participant in University dramatics, submits to the English Department the best essay on drama or the theatre.

E. K. Cutter Prize.—The E. K. Cutter Prize in English was established by the late Marion Kendall Cutter "for excellence in the study of English." An annual prize of \$55 is awarded to the member of the graduating class whose record in English, combined with general excellence, shows most marked aptitude for and attainment in English studies.

Isaac Davis Prizes.—These prizes, established by the Honorable Isaac Davis, of Massachusetts, in 1847, are awarded annually to such members of the senior class as shall have made the greatest progress in public speaking during their connection with the University. The prizes are as follows: first prize, \$25; second prize, \$20; third prize, \$10.

The award of these three prizes is determined by a public-speaking contest in which the participants deliver original orations. Only members of the senior class who are candidates for the degree of Bachelor of Arts or Bachelor of Science are eligible to compete.

Delta Gamma Prize.—Beta Rho Chapter of Delta Gamma Fraternity offers annu-

ally a prize of \$10 to the woman member of the freshman class who at the end of that year has the most outstanding record in scholarship, extracurricular activities, and service to the University.

Delta Zeta Prize.—Delta Zeta Sorority offers annually a prize of \$10 to be awarded to the student maintaining the highest average in Zoology 1-2.

Elton Prize.—The Elton Prize of \$30, established by the Reverend Romeo Elton, of Exeter, England, is awarded annually to the student having the highest average in the most advanced course in the Greek language and literature.

School of Engineering Distinguished Scholar.—The Faculty of the School of Engineering awards a certificate to the senior who graduates with the highest scholastic standing. In addition, the student's name is engraved on a plaque displayed in Tompkins Hall. One award is made each year.

Jesse Frederick Essary Prize in Journalism.—This memorial prize of \$200, established in 1948 by the late Helen Essary Murphy, is awarded annually to a student who has given promise of sound citizenship and who submits the best printed and published evidence of ability in "forthright reporting" and good journalistic writing, either in a student publication or elsewhere.

Joshua Evans III Prize in the Political and Social Sciences.—This memorial prize of \$100, "established by friends because of an outstanding life," is awarded annually to that man in the graduating class of The George Washington University "who has demonstrated his signal ability in the social and political sciences and who has given promise of the interpretation of that ability in good citizenship among his fellows."

Willie E. Fitch Prize.—The Willie E. Fitch Prize of \$75, established in 1883 by James E. Fitch, in memory of his son, is awarded annually to a senior student for the best examination in chemistry.

Allie S. Freed Prize.—This prize of \$40, established in 1957 by Mrs. Allie S. Freed, is awarded annually to a member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Preventive Medicine.

Charles Glover Prize.—This prize, established in 1957 by Charles Carroll Glover, Jr., a Trustee of the University, in memory of his great-grandfather, Charles Glover, an illustrious member of the bar of the District of Columbia, consists of selected law books and is awarded annually to the student in the Law School who has attained the highest average grade in the third-year, full-time course.

Alice Douglas Goddard Prize.—This prize of \$75 was established in 1941 by Frederick Joseph Goddard of Georgetown, D. C., in memory of Alice Douglas Goddard, and is awarded annually to the upper division student making the highest average in American literature.

Edward Carrington Goddard Prize.—This prize of \$75 was established in 1923 by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard, of Georgetown, D. C., in memory of Edward Carrington Goddard, class of '81, and is awarded to the junior or senior student making the highest average in the French language and literature.

James Douglas Goddard Prize.—This prize of \$75 was established in 1923 by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard, of Georgetown, D. C., in memory of James Douglas Goddard, class of '01, and is awarded to the senior student making the highest average in pharmacy.

Morgan Richardson Goddard Prize.—This prize of \$75 was established in 1923 by Mary Williamson Goddard, Alice Douglas Goddard, and Frederick Joseph Goddard.

of Georgetown, D. C., in memory of Morgan Richardson Goddard, and is awarded to the junior or senior student making the highest average in the following fields: economics, business administration, foreign commerce, and public accounting.

Alec Horwitz Prize.—This prize of \$100, established in 1959 by Dr. Alec Horwitz, is awarded annually to a senior in the School of Medicine who has demonstrated exceptional proficiency in the field of surgery.

Gardiner G. Hubbard Memorial Prize in United States History.—This prize of \$60 was established by Mrs. Gertrude M. Hubbard in memory of her husband, the late Gardiner G. Hubbard, and is awarded annually to that member of the graduating class majoring in history who has maintained the highest standing in courses in United States history.

Kappa Beta Pi Prize.—Eta Alumnae Chapter of Kappa Beta Pi Legal Sorority offers an annual prize which consists of a copy of Blackstone's *Commentaries* or a legal dictionary to be awarded to the woman law student in the freshman class who attains the highest average for the freshman year.

Kappa Kappa Gamma Prize.—Kappa Kappa Gamma Sorority offers annually a prize of \$10 to the full-time freshman who achieves the best record in Botany 1-2.

John Bell Larner Prize.—This prize, established by the bequest of John Bell Larner, consists of a medal which is awarded annually to that member of the graduating class in the Law School who attains the highest average grade in the entire course for the degree of Bachelor of Laws or Juris Doctor.

Huron W. Lawson Prize.—This prize of \$100, established in 1957 by Mrs. Huron W. Lawson in memory of her husband, Dr. Huron W. Lawson, who was a distinguished member of the Medical Staff of The George Washington University, is presented annually to a member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Obstetrics and Gynecology.

Martin Mahler Prize in Materials Testing.—This prize, established in 1953 by Martin Mahler, consists of a one-year membership in the American Society for Testing Materials and is awarded to the upper division or graduate student in engineering who submits the best reports on tests in the Materials Laboratories course with preference given to prestressed concrete tests.

Mortar Board Prize.—This prize, consisting of a silver cup, is awarded annually to the woman student in the sophomore class having a scholarship average of B or higher and the most outstanding record in activities.

Julius S. Neviaser Prize in Orthopedic Surgery.—This prize of \$100, established in 1956 by Dr. Julius S. Neviaser, is awarded annually to the student in the junior class of the School of Medicine who scores the highest grade in a written examination in Orthopedics.

Omicron Delta Kappa Prize.—Alpha Delta Circle of Omicron Delta Kappa Fraternity offers annually a plaque to be awarded to "that member of the senior class who throughout his course has done the most constructive work in the furtherance and upbuilding of the University student activities."

John Ordronaux Prizes.—These prizes were established in 1909 by the bequest of John Ordronaux.

The amount of \$140 is awarded to the member of the graduating class in the School of Medicine who has the highest scholastic standing.

The amount of \$70 is awarded annually to the student in the Law School who has attained the highest average grade in the first-year, full-time course; and \$70 to the student who has attained the highest average grade in the second-year full-time course.

Phi Delta Kappa Prize.—This prize, established in 1956 by Beta Gamma Chapter of Phi Delta Kappa, consists of a \$50 United States Government Savings Bond and is presented annually to the outstanding senior man in the teacher education program in the School of Education.

Phi Eta Sigma Prize.—The George Washington University Chapter of Phi Eta Sigma offers annually to the male student attaining the highest scholastic average in his first full semester of work, a choice book selected from the field of the recipient's major interest. The winner's name will be engraved on a plaque in the Office of the Dean of the Junior College.

Pi Beta Phi Prize.—A prize of \$20 is awarded annually by the District of Columbia Alpha Chapter of Pi Beta Phi Fraternity to that woman member of the senior class who throughout her college course has done the most constructive work in the promotion of student activities among the women of the University.

Pi Lambda Theta Prize.—This prize, established in 1956 by Alpha Theta Chapter of Pi Lambda Theta, consists of a \$50 United States Government Savings Bond and is presented annually to the outstanding senior woman in the teacher education program in the School of Education.

Psi Chi Prizes.—The George Washington University Chapter of Psi Chi, national honorary society in psychology, offers annually two awards in the field of psychology; the first, \$25 to the best undergraduate student in Experimental Psychology; the second, \$25 to the graduate student submitting the best Master's thesis in Psychology.

Ruggles Prize.—The Ruggles Prize of \$35, established by Professor William Ruggles in 1859, is awarded annually to a candidate for a baccalaureate degree for excellence in mathematics.

Sigma Kappa Prize.—Zeta Chapter of Sigma Kappa Sorority offers an annual prize of \$10 to the student with the highest grade in the final examination in General Chemistry.

Sigma Tau Prize.—Xi Chapter of Sigma Tau Fraternity offers annually a medal to be awarded to that member of the freshman class in the School of Engineering who maintains the highest scholastic standing in the work of the entire year.

Society of Colonial Wars in the District of Columbia Prize.—This award, in the form of a gold medal, established in 1953 by the Society of Colonial Wars in the District of Columbia, is to be awarded to a candidate for a graduate degree who, in the judgment of the Faculty of the Department of History, submits a thesis or dissertation demonstrating excellence in historical research in American Colonial history. The University reserves the right to withhold the award if no thesis or dissertation attaining the required degree of excellence is submitted.

Staughton Prize.—The Staughton Prize of \$30, established by the Reverend Romeo Elton, is awarded annually to the student making the best record in the most advanced course in the Latin language and literature.

James MacBride Sterrett, Jr., Prize.—This prize, established in 1911 by Professor James MacBride Sterrett in memory of his son, consists of the *American Institute of Physics Handbook* awarded annually to that student who obtains the highest average in Physics 14, 15, and 16.

Charles Clinton Swisher Historical Club Prize.—This prize of \$100, established in 1936 by the Charles Clinton Swisher Historical Club and augmented in 1941 by the bequest of Professor Charles Clinton Swisher, is awarded annually to the student who submits the best essay covering some phase of medieval history.

Theta Tau Activities Plaque.—Gamma Beta Chapter of Theta Tau Fraternity offers annually a plaque to be awarded to that member of the senior class who has the

most outstanding record in activities in the School of Engineering during the entire period of his attendance.

Thomas F. Walsh Prize.—This prize of \$150, established in 1901 by Thomas F. Walsh, is awarded annually to that student who submits the best essay in Irish history.

Washington Personnel Association Prize.—The Washington Personnel Association awards annually a certificate and \$25 to an outstanding graduating senior in business administration who shows general excellence in studies, demonstrates superiority in one or more courses in personnel administration, and shows qualities of leadership or promise through extra-scholastic activities.

Alexander Wilbourn Weddell Prize.—This prize of \$350, established in 1923, by Mrs. Virginia Chase Weddell, is awarded annually to a candidate for a degree who writes the best essay on the subject of "the promotion of peace among the nations of the world." The prize essays shall become the property of the University and shall not be printed or published without the written consent of the University. The University reserves the right to withhold the award if no essay attaining the required degree of excellence is submitted.

MILITARY AWARDS

Society of American Military Engineers Gold Medal.—This medal, offered by the Society of American Military Engineers, is awarded annually to selected Air Force ROTC cadets in the next-to-last year of their engineering course and in the last year of such course. Nominations are made jointly by the Professor of Air Science and the Dean of the School of Engineering, and final selection is made nationally by a board of three senior Air Force officers.

National Defense Transportation Association Award.—This medal, offered by the National Defense Transportation Association, is awarded to the outstanding senior graduate who qualifies for the Air Force Specialty of Air Transportation Officer or Surface Transportation Officer. The award is given in recognition of leadership qualities, academic standing, aptitude for military service, and for meritorious achievement in furthering the aims and objectives of the Association in the promotion of preparedness for national defense.

Armed Forces Communications and Electronics Association Gold Medal.—These medals, offered by the Armed Forces Communications and Electronics Association, are awarded annually to outstanding senior Air Force ROTC cadets majoring in Electrical Engineering who demonstrate outstanding qualities of military leadership and distinguish themselves either academically or by leadership in campus activities.

Air Force Association Silver ROTC Medal.—This medal, offered by the Air Force Association, is awarded annually to that cadet, who, after completion of Air Force ROTC summer training, is judged to be the outstanding cadet among those who have indicated their intention to apply for flying training upon graduation.

Reserve Officers' Association Medals.—Gold, silver, and bronze medals, offered by the Reserve Officers' Association of the District of Columbia, are awarded annually to those cadets enrolled in Air Science 101 and 102, 51 and 52, 21 and 22, respectively, who receive the highest grades for the current year in the leadership and academic phases of the Air Force ROTC course.

Chicago Tribune Gold ROTC Medal.—This medal, offered by *The Chicago Tribune*, is awarded each semester to that cadet enrolled in Air Science 151-52 who has made an outstanding contribution to the effectiveness of the Air Force ROTC program by demonstrating the highest ideals of leadership and scholastic excellence.

Chicago Tribune Silver ROTC Medal.—This medal, offered by *The Chicago Tribune*, is awarded each semester to that cadet of the Air Force ROTC Basic Course who has demonstrated outstanding leadership potential and who has maintained excellent scholastic standing in the University.

Sons of the American Revolution ROTC Medal.—This medal, offered by the District of Columbia Society, Sons of the American Revolution, is awarded annually to that freshman cadet of each Air Force ROTC flight who demonstrates to the maximum degree traits and qualities of good citizenship and meets the prescribed requirements established by the donor.

Unit Leadership Trophy.—This silver trophy offered by Walter G. Bryte, Jr., Colonel, USAF (Retired), first Professor of Air Science at this University, is awarded annually to the Air Force ROTC flight adjudged best in a competitive review and inspection. The Cadet Commander of this flight is presented a set of engraved Second Lieutenant's insignia.

The Colonial Cadet Rifle Trophy.—This trophy, offered by Master Sergeant Jerome Gleason, USAF, first coach of the Air Force ROTC Rifle Team at this University, is awarded to that cadet who is judged to be the outstanding member of the rifle team.

Arnold Air Society Scroll.—This scroll, offered by the Carl Spaatz Squadron of the Arnold Air Society, is awarded annually to the outstanding cadet completing the basic course with a cumulative average of B or better in Air Force ROTC courses.

Pershing Rifles Gold, Silver, and Bronze Achievement Medals.—These medals are awarded annually by the National Headquarters to those Air Force ROTC cadets who are Pershing Riflemen and who are judged to be outstanding examples of the ideals of the Pershing Rifles.

Republic Aviation Award.—An engraved identification bracelet, offered by the Republic Aviation Corporation, is awarded annually to that cadet enrolled in Air Science 101 and 102 who, in competition, makes the most effective verbal presentation on the Air Power theme.

The Convair Award.—A Convair miniature airplane, offered by the Consolidated Vultee Aircraft Corporation is awarded annually to that cadet enrolled in Air Science 51 and 52 who achieves the highest cumulative grade in the basic course and who applies for flight training.

Reserve Officers' Association Junior Memberships.—Five junior memberships, offered by the Reserve Officers' Association of the District of Columbia, are awarded annually to the five Air Force ROTC cadets who obtain the highest grades in Air Science 101 and 102.

National Rifle Association Club Champion Medal.—This medal, offered by the National Rifle Association, is awarded to a sophomore, junior, or senior member of the Air Force ROTC Rifle team judged to be the outstanding member of the team based on marksmanship, participation in team matches, and contribution to the effectiveness of the team.

National Rifle Association Qualification Medals.—These medals, offered by the National Rifle Association, are awarded annually to members of the Air Force ROTC Rifle team qualifying as Expert, Sharpshooter, or Marksman in indoor rifle firing.

Air Force ROTC Rifle Team Awards.—Trophies, plaques, and medals are awarded annually to Air Force ROTC Rifle Teams through successful competition in the following:

The Air Force ROTC Liaison Area Championship Matches
The Army and Area Intercollegiate and Interscholastic Matches

The Secretary of the Air Force ROTC Rifle Match
The William Randolph Hearst National ROTC Rifle Matches.

FINANCIAL AID STUDENT EMPLOYMENT

Graduate and undergraduate student assistantships are available in several departments of the University. Application should be made to the executive officer of the department of instruction concerned.

The Placement Office maintains a registry of positions available in many fields of work and refers qualified applicants for consideration.

LOAN FUNDS

The following loan funds are available to students in the University in accordance with the qualifications placed thereon by the donors. Students in the schools of Law, Medicine, and Pharmacy should direct inquiries to and file applications with their respective deans. All other inquiries should be directed to the Office of the Treasurer.

University Loan Fund.—The Trustees of The George Washington University have made available a fund for short-term loans to students to provide for partial payment of tuition. Applications for these loans shall be made three days prior to the dates on which tuition installments are due.

Joseph H. Himes Loan Fund.—This fund contributed by Joseph H. Himes, in the amount of \$17,542.19, is available for loans to students in the School of Medicine.

Home Economics Loan Fund.—This fund of \$382.35, contributed by the D. C. Home Economics Association, is available for loans to senior girls majoring in Home Economics.

Kellogg Foundation Hospital Administration Loan Fund.—The W. K. Kellogg Foundation established in 1960 a fund of \$10,000 for loans to full-time graduate students in hospital administration.

Kellogg Medical School Loan Fund.—The W. K. Kellogg Foundation in Battle Creek, Michigan, has established a fund of \$20,946.68 for loans to students in the School of Medicine.

Law Association Loan Fund.—The George Washington Law Association has established a loan fund in the amount of \$2,620.27 for loans to students in the Law School requiring less than thirty semester hours credit toward the degrees of Bachelor of Laws or Juris Doctor.

School of Medicine Loan Fund.—This fund of \$16,636.30, contributed by medical students, is available for loans to students in the School of Medicine.

National Defense Student Loan Fund.—This fund is available to full-time undergraduate and graduate students who are in need of financial assistance. Priority is given those applicants who express a desire to teach in elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language. After application for admission to the University has been completed, application on forms prescribed for this loan fund must be filed in the Office of the Treasurer no later than August first for the fall semester, December first for the spring semester, and May first for the Summer Sessions.

Pfizer Medical School Loan Fund.—Chas. Pfizer & Co., Inc., has established a fund of \$1,055.03 for loans to students in the School of Medicine.

Benjamin Schoenfeld Memorial Pharmacy Loan Fund.—This fund, established by

the family and friends of Benjamin Schoenfeld, in the amount of \$2,155.47, is available for loans to students studying pharmacy.

Sutherland Medical School Loan Fund.—This fund, in the amount of \$1,637.96 and established by Mrs. Rose L. Sutherland, is available for loans to students in the School of Medicine.

A list of banks and commercial finance firms offering various types of tuition payment plans is available through the Office of the Treasurer.

REGULATIONS

A student enrolled in the University is required to conform to the following University regulations and to comply with the rules and regulations of the college, school, or division in which he is registered.

A student who withdraws or is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return.

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Faculty) for subsequent registration in any unit of the University.

ATTENDANCE

A student may not attend classes until registration is completed and fees due are paid. Regular attendance is required. A student may be dropped from any course for undue absence.

A student suspended for any cause may not attend classes during the period of suspension.

SCHOLARSHIP REQUIREMENTS

A student who fails to maintain the scholarship requirements of the college, school, or division in which he is registered may be dismissed from the University.

GRADES

Grades are mailed to the student through the Office of the Registrar at the close of each semester. They are not given out by instructors.

Undergraduate.—The following grading system is used: *A*, excellent; *B*, good; *C*, average; *D*, passing; *F*, failing. Whenever a grade has not been assigned the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given the instructor for the student's failure to complete the required work of the course. An "incomplete" cannot be made up after the lapse of one calendar year except by written permission of the dean's council of the college, school, or division concerned. Courses from which a student has withdrawn by proper authorization will be indicated by the symbol *W*. A student may not repeat for grade a course in which he has received a grade of *D* or above, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Registrar by the appropriate departmental executive officer.

Graduate.—For graduate work, grades are indicated as *E* (excellent), *S* (satisfactory), *U* (unsatisfactory), *I* (incomplete).

For the grading systems of the School of Medicine and the Law School, see the explanations in the announcements of those schools.

THE QUALITY-POINT INDEX

Undergraduate.—Scholarship is computed in terms of the quality-point index, obtained by dividing the number of quality points by the number of semester hours for which the student has registered, both based on the complete record in this University.

Quality points are computed from grades as follows: *A*, four points; *B*, three points; *C*, two points; *D*, one point; *F*, no points, for each semester hour for which the student has registered. Courses marked *W* or *I* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded, or at the close of a calendar year, whichever occurs first. If an "incomplete" is not superseded by a proper grade within the allotted time, it is computed as zero quality points. Grades in courses taken at another institution are not considered in computing the quality-point index.

EXAMINATIONS

Examinations are scheduled at the end of each semester or at the completion of the course.

ACADEMIC DISHONESTY

Evidence of dishonesty on the part of any student will result in his suspension from the University upon the recommendation of the appropriate dean's council.

A student found guilty of dishonesty will be deprived of credit for *all* courses in the semester during which the dishonest act occurs.

A student may apply to be readmitted in the semester or summer session which begins next after an interval of one year from the date of suspension.

WITHDRAWAL

Withdrawal from a course or from the University, *without academic or financial penalty*, requires the permission of the dean of the college, school, or division in which the student is registered. Permission to withdraw from the University will not be granted a student who does not have a clear financial record. (See "Fees and Financial Regulations", pages 22 and 23.)

Withdrawal between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases. (See page 99 for regulations governing withdrawal from the School of Engineering.)

All charges for courses dropped without the approval of the dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

A student may not withdraw from either the basic course or the advanced course of the Air Force ROTC without the approval of the President of the University.

CHANGES IN PROGRAM OF STUDIES

Changes within a College, School, or Division.—A student may not change or drop courses (see "withdrawals", above) or change his status to that of auditor

* The University work week is Monday through Friday, inclusive.

except with the approval of the dean of the college, school, or division in which he is registered.

Change from one section to another of the same course may be made with the approval of the dean and the department concerned.

Change from one major subject to another within the same college or school may be made with the approval of the dean. All requirements of the course of study to which the change is made must be met.

Transfer within the University.—Transfer from one college, school, or division to another may be made only with the approval of the deans concerned. Except in cases of normal progression from the Junior College in a regular four-year program, application for transfer must be made to the Director of Admissions on the form provided by his office.

Students wishing to transfer from the Division of University Students to a degree-granting college or school of the University should note that a maximum of 45 semester hours will be accepted in transfer.

Students transferring within the University are advised to study carefully the graduation requirements on pages 43 and 44 and to note that in all undergraduate divisions, except the Junior College and the College of General Studies, 30 semester hours, including at least 12 semester hours in the major field, must be completed in residence in the school or college from which the degree is sought. Upon transfer the student should consult the dean concerned and understand clearly the requirements he must fulfill. (For residence requirements in the Junior College, see page 50. For information concerning the College of General Studies, see separate bulletin.)

CREDIT

Credit is given only after registration for a course and satisfactory completion of the required work, or upon the assignment of advanced standing in accordance with the regulations of the several colleges, schools, and divisions.

On request the Registrar will issue to undergraduate degree candidates a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

In special instances, a person who has been admitted to the University may be registered, with the permission of the instructor, as an "auditor" in a class (no academic credit). An auditor is not required to take active part in the exercises or to take examinations.

TRANSCRIPTS OF RECORD

Official transcripts of student records will be forwarded on request to other institutions. Unofficial copies of records will be issued to the student on request. No charge is made for the first copy; a fee of one dollar is charged for each one thereafter. No certificate of work done will be issued for a student who does not have a clear financial record.

SUMMER SCHOOL CREDIT

A student who plans to attend summer school sessions at another institution with the intention of having credits so obtained apply toward graduation from this University must first secure the written approval of the dean of his college or school. In no event will such credits be recognized to an amount in excess of that which might be earned in a similar period in this institution.

PHYSICAL EDUCATION REQUIREMENTS

Students in the Junior College (except those enrolled in the Physical Education for men curriculum) are required to take Physical Education 1-2 and 11-12 unless they are registered for less than 9 semester hours or unless regular employment during the day makes it necessary to take all classes during the evening hours. Air Force ROTC cadets and a limited number of freshman and sophomore women may substitute Air Science 1-2 and 11-12 for the physical education requirement.

Any other exemptions will be granted only upon written petition which has been recommended by the physical education department concerned and approved by the dean of the college or school in which the student is registered.

Junior College students exempt from the physical education requirement will be required to substitute four hours of elective.

A student entering the University with advanced standing is not exempt from the physical education requirement unless he has satisfactorily met the requirement elsewhere.

The required medical and physical examinations, as specified by the departments of physical education, will be arranged at the time of registration.

GRADUATION REQUIREMENTS

To be recommended by the Faculty for graduation a student must have met the admission requirements of the college or school in which he is registered, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

Application for Graduation.—It is the student's responsibility to file an application for graduation in the Office of the Registrar at the time of registration for the last semester of the senior or final year.

Scholarship.—In all undergraduate divisions of the University the scholarship requirement for graduation is a quality-point index of at least 2.00.

The graduate student must meet the scholarship requirements for the particular degree for which he is registered.

Curriculum.—Minimum curriculum requirements for each degree are stated under the college or school offering work in preparation for the degree. (For Air Force ROTC graduation requirements see the Department of Air Science.)

Residence.—Unless otherwise specified, in all undergraduate divisions of the University, a minimum of thirty semester hours, including at least twelve hours in the major field, must be completed in residence in the school or college from which the degree is sought. This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work may be counted in residence, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the dean of the college or school concerned to pursue work elsewhere, the work of the senior or final year must be completed in residence.

The graduate student must meet the residence requirements for the particular degree for which he is registered.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return unless during his absence he maintains "in residence" status by paying the appropriate fee, see page 21. For the purpose of this regulation the summer term will be disregarded, unless the degree is to be conferred at the Fall Convocation.

The student who has completed his tuition requirements, but whose graduation is deferred for any reason, must maintain "in residence" status by paying the residence fee for the semester or summer session immediately preceding the graduation at which he expects to receive his degree.

Graduate Record Examination.—All candidates for Bachelor's degrees in Columbian College, the School of Engineering, the School of Government, and the College of General Studies are required to take two parts of the Graduate Record Examination in the University's institutional testing program. The examinations are conducted by the University twice a year: the Fall Testing Session (December 9, 1961) for seniors graduating in February, and the Spring Session (April 7, 1962) for those graduating in June or October. Dates of the examinations are announced in the *Schedule of Classes*.

Each senior required to take the Graduate Record Examination must register for it in the office of his dean when he registers for his final regular semester of study (excluding summer sessions). A \$10 examination fee is payable at the time of registration.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. By special permission seniors who expect to graduate in June may take the Graduate Record Examination at the previous Fall Testing Session, so as to have transcripts available early in the year when applying for admission to graduate schools.

National Teacher Examinations.—All candidates for the Bachelor of Arts degree in the School of Education are required to take the National Teacher Examinations at one of the three regularly scheduled administrations conducted in February, July, and October. Candidates expecting to graduate in June should take the examinations the previous February. Those expecting to graduate in October should take the examinations the previous July. Those expecting to graduate in February should take the examinations the previous October.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. A copy of test scores must be forwarded to the School of Education.

Each senior required to take the National Teacher Examinations must register for them in the office of the Dean at least thirty days prior to the date of the administration of the examinations. Details concerning time, place, registration, and fees may be obtained in the Office of the School of Education.

See the announcements of the various schools and colleges in this CATALOGUE for a description of the tests required.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Thesis or Dissertation.—A thesis or dissertation submitted in partial satisfaction of requirements for the Master's degrees, the degree of Doctor of Education, the degree of Doctor of Juridical Science, the degree of Doctor of Business Administration, the degree of Doctor of Philosophy, or the degree of Doctor of Science must be presented in its final form to the dean of the college or school concerned no later than the date specified in the University calendar. Three complete copies of each are required. It is the responsibility of the candidate for a graduate degree to obtain from his dean a printed copy of the regulations governing the styling and reproduction of theses and dissertations, which are rigidly enforced.

Accepted theses or dissertations, with accompanying drawings, become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the appropriate dean.

Presence at Graduation.—A candidate is required to be present at the graduation exercises unless written application for graduation *in absentia* is approved by the dean of his college or school.

HONORS

With distinction.—In all undergraduate divisions of the University the degree may be conferred "with distinction", at the discretion of the Faculty, if a student attains a quality-point index of 3.50 or higher on all work taken at this institution. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

In the School of Medicine and the Law School, degrees may be conferred "with distinction", at the discretion of the Faculty, on those students who attain an average of *A* on all work taken for the degrees.

Special honors.—Special honors may be awarded by the Faculty to any member of the graduating class for outstanding achievement in the student's major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.

2. The student must meet such other conditions as may be set at the time his candidacy is approved.

3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.

4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

Military honors.—An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Cadet" if he (1) has completed Air Science 101 and 102 with an academic standing among the upper third of the students enrolled therein; (2) has an accumulative academic average of *B* or better; (3) possesses high moral character and definite aptitude for service in the Air Force; (4) has distinguished himself by demonstrated leadership through participation in recognized extracurricular activities and while in attendance at an Air Force ROTC Summer Training Unit. A "Distinguished Air Force ROTC Cadet" is authorized to wear a "Distinguished Cadet" badge above the right breast pocket of the uniform. He may submit an application for a regular commission in the United States Air Force, which is given final consideration upon his designation as a "Distinguished Air Force ROTC Graduate."

An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Graduate" if he has (1) been designated a "Distinguished Air Force ROTC Cadet" and maintained the standards required of a "Distinguished Air Force ROTC Cadet" during the period between designation and graduation; (2) completed the Air Force ROTC Advanced Course; and (3) completed the requirements for a Bachelor's degree. A "Distinguished Air Force ROTC Graduate" will be presented with a certificate signed by the Commandant, Air Force ROTC, and, if he made application, will be considered for a regular commission in the United States Air Force.

THE LIBRARY

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card issued upon the payment of fees, must be presented as identification.

The loan period for most books available for home circulation is two weeks, with an additional two-week renewal. A fine of five cents will be charged for each day a book is overdue. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

The Colleges, Schools, and Divisions

THE JUNIOR COLLEGE

THE FACULTY AND STAFF OF INSTRUCTION *

G. M. Koehl, *Dean*; W. L. Turner, *Assistant Dean*; J. C. King, *Assistant Dean*

Professors C. W. Bliven, P. W. Bowman, J. W. Brewer, H. F. Bright, A. E. Burns, Elizabeth Burtner, R. D. Campbell, J. H. Coberly, C. W. Cole, R. H. Davison, D. C. Faith, C. E. Gauss, H. L. Geisert†, Wood Gray, I. B. Hansen, G. F. Henigan, Jr., Thelma Hunt, Herbert Jehle, F. E. Johnston, E. L. Kayser, R. D. Kennedy, Frances Kirkpatrick, D. C. Kline, G. M. Koehl, J. H. Krupa, J. F. Latimer, Helen Lawrence, L. P. Leggette, W. K. Legner, C. D. Linton, T. P. G. Liverman, G. E. McSpadden, Florence Mears, H. M. Merriman, R. H. Moore, Edith Mortensen, W. H. Myers, C. R. Naeser, N. D. Nelson, C. E. Olmstead, C. W. Pettit, M. I. Protzman, Gretchen Rogers, W. F. Sager, R. P. Schlabach, Jr., Wilson Schmidt†, E. S. Shepard‡, Lewis Slack, R. B. Stevens, Geza Teleki, Kathryn Towne, F. S. Tupper, B. D. Van Evera, R. C. Vincent, W. R. West, N. A. Wiegmann, R. E. Wood, S. N. Wrenn

Associate Professors J. G. Allee, Jr.§, Lee Bielski, W. E. Caldwell||, W. G. Clubb#, V. J. DeAngelis, A. H. Desmond, R. G. Hanken, J. W. Harkness, R. C. Haskett||, P. H. Highfill, Jr., H. H. Hobbs, Eva Johnson, J. C. King, F. C. Kurtz, H. L. LeBlanc, L. P. Leite, G. E. Mazzeo, Muriel McClanahan, C. Y. Meade, S. C. Munson, T. P. Perros, J. P. Reesing, Jr., J. W. Robb, Carol St. Cyr, William Schmidt, Mildred Shott, J. W. Skinner, Loretta Stallings, R. W. Stephens, E. L. Stevens, Rafael Supervia‡, R. B. Thompson, W. L. Turner, C. E. Tuthill, R. D. Walk, R. H. Walker, Jr., H. W. Westermann, D. G. White, R. C. Willson, Helen Yakobson.

Assistant Professors R. E. Baker, J. M. Campbell, Percy Crosby, J. T. Davis, J. A. Frey, R. E. Gajdusek, Lyndale George, Natasha Hollbach, R. G. Jones, Carlos Lozano, H. R. Ludden, J. L. Metivier, Jr., Margaret Montzka, H. D. Osterle, E. E. Pantzer III, E. E. Pontius, Jr., G. A. Santangelo, R. H. Schlagel, R. C. Sentz, W. A. Smith, Jeanne Snodgrass, P. C. Steele#, J. G. Sweeney, Nancy Tischler, R. Z. Vause, Elizabeth Wright, S. S. Yeandle, Jr.

Instructors Margaret Ethier, R. E. Thomas, Connie Vaughan

COMMITTEES**

THE DEAN'S COUNCIL††

1962: T. P. Perros, R. W. Stephens; 1963: W. E. Caldwell, Florence Mears;
1964: G. E. Mazzeo, Elizabeth Wright

COMMITTEE ON ADMISSION AND ADVANCED STANDING

J. C. King (*Chairman*), W. G. Clubb, Margaret Montzka, W. A. Smith, R. C. Willson

* The President of the University, the Dean of Faculties, the Dean and Assistant Deans of the College, the Registrar of the University, the Director of Admissions of the University, the Professors, Associate Professors, Assistant Professors, and Instructors constitute the Faculty. This listing of Faculty and Staff of Instruction is for the academic year 1960-61.

† On leave of absence fall semester 1960-61.

‡ On sabbatical leave fall semester 1960-61.

§ On sabbatical leave summer 1961.

|| On sabbatical leave spring semester 1960-61.

On leave of absence 1960-61.

** The Dean of the Junior College is a member ex officio of all committees.

†† Elected by the Faculty.

COMMITTEE ON SCHOLARSHIP

W. L. Turner (*Chairman*), R. G. Hanken, J. C. King, Muriel McClanahan, J. L. Metivier, Jr., Edith Mortensen, R. C. Vincent

JUNIOR COLLEGE ADVISORY COMMITTEE

G. M. Koehl (*Chairman*), R. E. Baker, C. W. Bliven, J. C. King, Frances Kirkpatrick, J. H. Krupa, Carol St. Cyr, Mildred Shott, Loretta Stallings, H. G. Sutton, Nancy Tischler, W. L. Turner, R. C. Vincent

GENERAL INFORMATION

INTRODUCTORY

The Junior College, which administers the first two years of the standard four-year college program in the liberal arts and sciences, was established in 1930. The Junior College curricula continue the studies of a cultural nature begun in high school and prepare for the more specialized work which is to follow. Emphasis is placed upon the social, cultural, biological, and physical background of civilization and upon the discipline needed for more advanced work.

The pre-Columbian College curricula prepare students for advanced work in the fields of arts and letters and in science. They also serve as the first two years of the prelegal and premedical programs. The curriculum in Science meets the requirements for the first two years of the Bachelor of Science in Medical Technology curriculum offered by Columbian College in collaboration with the Department of Pathology and the University Hospital.

The Junior College also provides the preprofessional work required for admission to the schools of Pharmacy; Education; and Government, Business, and International Affairs.

In addition it provides the following two-year curricula in vocational training: Accounting, Home Economics, Physical Sciences, and Secretarial Studies.

ADVISORY SYSTEM

Members of the Faculty, selected for their knowledge of Junior College requirements and student programs, advise students in making up their programs of study for each semester. A separate staff of experienced advisers under the chairmanship of the Dean assists those students who find it difficult to make adjustments to college life because of scholastic or other reasons. Students who are "warned" or who are on probation may be required to consult these advisers at regular intervals. Students are encouraged to consult any member of the Advisory Staff or their instructors about college problems at any time.

Copies of notices of "warning" or probation are sent to the parents or guardians of students on request, and the Dean and members of the Advisory Staff are available for consultation with parents or guardians concerning student problems.

REGULATIONS

Students in the Junior College are subject to, and are expected to familiarize themselves with, the regulations regarding ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 9-23, and the University regulations stated on pages 40-46.

SCHOLASTIC-APTITUDE TESTS

Students admitted to the Junior College may be required to take the scholastic aptitude tests of the University.

REQUIRED PLACEMENT EXAMINATIONS

English.—Special placement examinations, required of all entering freshmen, are conducted by the English Department. Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared are assigned to English 1X.

Foreign Languages.—A standardized placement examination is required of all entering students who wish to continue in college the language begun in high school (French, German, Russian, or Spanish). Upon completion of the examination, assignment is made to the appropriate course.

The Use of Correct English.—The use of correct English, oral or written, is required not only in English but also in all other courses (see page 63).

FIRST- AND SECOND-GROUP COURSES

A Junior College student may not take second-group courses (courses numbered 101-200) without the written permission of the instructor and of the Dean of the Junior College. A student is not permitted to postpone a required first-group course in order to take a second-group course for elective credit. The principle that first-group courses must be taken in the Junior College years, and advanced courses in Columbian College and the professional schools, is rigidly adhered to in approving student programs. No student on probation may take second-group courses without the written permission of the Committee on Scholarship.

AMOUNT OF WORK

Sixteen or 17 semester hours constitute a normal academic load. A student not on probation may be permitted by the Dean to take 18 semester hours.

A student whose quality-point index is 3.50 may, with the permission of the Dean, take 19 or 20 semester hours. No student may take more than 20 hours, except with the permission of the Committee on Scholarship.

For an employed student working 20 or more hours a week, 10 semester hours constitute a normal academic load. An employed student not on probation may be permitted by the Dean to take 11 hours. An employed student whose quality-point index is 3.50 may be permitted by the Dean to take 13 or 14 hours.

A student who accepts employment after registration or at any time during the semester must report immediately to the Dean so that his program may be adjusted, if necessary.

ATTENDANCE

The student is held responsible to his instructor for all the work of the course. All absences must be excused before provision is made for him to make up the work missed.

With the exceptions noted below, occasional absences from a course not to exceed in number the semester hours of credit for the course, are automatically excused. (If the course has distinct divisions such as lectures, laboratories, recitations, etc., these excuses apply pro rata to such separate divisions.) Absences immediately preceding or following holiday periods are counted double.

A student on probation is allowed no automatic excuses.

Excuses for absences from two or more consecutive class periods, and for absences

from examinations which have been announced in advance, require written application to the instructor.

A student whose absences from any class, whether excused or unexcused, are in excess of one-fourth of the total number of class periods will receive the grade of *F* for the course, except by special ruling of the Dean on recommendation of the instructor.

SCHOLARSHIP

The system of grading and computing scholarship is described on pages 40 and 41.

Honor Roll.—The name of every student who has a quality-point index of 3.50 or higher on the basis of his complete record at this University is placed on the honor roll and published. No consideration is given to those who have completed a total of less than 15 semester hours. A place on the honor roll does not mean that the student will receive honors upon graduation.

Dean's List.—The name of every student who makes a quality-point index of 3.50 or higher on a minimum of 15 semester hours of work taken in any one semester is placed on the Dean's List for that semester.

Probation.—A student must maintain a quality-point index of at least 2.00 to be in good academic standing.

CLASSIFICATION OF STUDENTS

A student who has satisfactorily completed at least 32 semester hours including 18 hours of his curriculum requirements is a *sophomore*.

THE DEGREES

The Junior College offers curricula leading to the degrees of Associate in Arts and Associate in Science.

REQUIREMENTS FOR THE DEGREES

RESIDENCE

The last 15 hours of work required for a degree must be taken in residence in the Junior College.

SCHOLARSHIP

A quality-point index of at least 2.00 is required.

A student who has attempted 12 or more semester hours and whose index is between 1.50 and 2.00 is placed on probation for the next 12 semester hours.

The student whose average is 2.00 or below for work undertaken during this probationary period is suspended. The student whose over-all quality-point index is still below 2.00 but whose average for work undertaken during the probationary period is above 2.00 may be continued on probation by the Committee on Scholarship.

Suspension.—A student whose quality-point index is below 1.50 is subject to suspension by the Committee on Scholarship.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. At the same time he must submit specific evidence to the Committee on Scholarship that he is better qualified to pursue college work.

A student suspended twice for poor scholarship will not be readmitted.

Mid-semester Warning.—At the end of the seventh week of each semester, instructors file in the Office of the Junior College the names of students who are doing work of *D* grade or lower. A notice of Warning is sent to the student and a copy

filed with the appropriate adviser. A "warning" constitutes notice to the student that he must consult his instructor and adviser at the earliest opportunity.

CURRICULUM REQUIREMENTS

The satisfactory completion of 64 semester hours is required, as outlined in one of the Junior College curricula described below.

Except for students intending to apply for the combined degrees of Bachelor of Arts and Doctor of Medicine or the degree of Bachelor of Science in Medical Technology, not more than 12 hours of professional courses may be included in the 124 hours required for the Bachelor's degrees in Columbian College. Junior College students electing professional courses under this rule must obtain the approval of the Dean of the Junior College before registration.

Physical Education Requirements.—Physical Education or Air Force ROTC Leadership Laboratory is required of all students in the freshman and sophomore years except students enrolled in the Physical Education for men curriculum. (See "Physical Education Requirements", page 43.)

Foreign Language Requirements.—In curricula requiring foreign languages a student must complete satisfactorily the equivalent of two years of college work in a single foreign language.

A student offering for admission four acceptable high school units of a single foreign language, or the equivalent, is not required to take any foreign language.

A student who offers less than four units and wishes to meet the Junior College requirement by continuing in the same language must take the language placement test (see page 49).

In general, one year of high school language is considered equivalent to one semester of college language.

In some instances foreign languages are required or recommended as preparation for advanced work in Columbian College and the professional schools. The student should consult his adviser as to these requirements, so that appropriate foreign languages may be included, when necessary, in his Junior College program.

English Requirements.—Entering students registered in the pre-Columbian College curricula must follow the sequence of English 1 or 1X, both halves of one of the introductory literature courses, and English 4. This does not apply to students transferring to these curricula or students registering in the preprofessional or vocational curricula.

JUNIOR COLLEGE CURRICULA

I. CURRICULA FOR ADMISSION TO COLUMBIAN COLLEGE AND THE PROFESSIONAL SCHOOLS

Each of the following curricula comprises the first two years of a standard four-year college course and prepares the student for upper division work. All curricula in this group lead to the degree of Associate in Arts.

A. COLUMBIAN COLLEGE:

1. ARTS AND LETTERS

The following two-year curriculum prepares for the Bachelor of Arts program in Columbian College:

| | Semester Hours |
|---|-------------------|
| English Composition and Literature .....English 1 or 1X; 51-52, 71-72, 91-92, Classical Lan- guages 71-72, French 51-52, German 51-52, Slavic Languages 91-92, or Spanish 51-52; English 4.... | 12 |
| Foreign Language .....See page 51 for foreign language requirement..... | 12 |
| Physical Education .....See page 43 for statement of requirement..... | 4 |
| Science .....Biology 1-2; Botany 1-2; Chemistry 3-4, 11-12; Ge- ology 1-2; Physics 11, 12; or Zoology 1-2..... | 6-8 |
| Social Studies .....Economics 1-2; Geography 51, 52; History 39-40, 71- 72; Political Science 1 and 9, 1 and 10, or 9-10; or Sociology and Anthropology 1-2..... | 6 |
| Elective*..... | 22 or 24 |
| Total..... | 64 |

2. SCIENCE

The following two-year curriculum prepares for the Bachelor of Science and the Bachelor of Science in Medical Technology curricula in Columbian College:

| | | |
|---|---|----------|
| English Composition and Literature | English 1 or 1X; 51-52, 71-72, 91-92, Classical Languages 71-72, French 51-52, German 51-52, Slavic Languages 91-92, or Spanish 51-52; English 4..... | 12 |
| Foreign Language | French, German, Russian, or nonscience elective..... | 12 |
| | NOTE.—A reading knowledge of French, German, or Russian is required. This may be satisfied by French 4, German 4, or Russian 4 or by special examination. | |
| Mathematics | Mathematics 3, 6, or electives..... | 6 |
| | NOTE.—The Mathematics 3 requirement may be satisfied by offering two years of high school algebra, acceptable for admission; the Mathematics 6 requirement may be satisfied by offering one-half year of high school trigonometry acceptable for admission. | |
| Physical Education | See page 43 for statement of requirement..... | 4 |
| Science | (a) Biology 1-2, Botany 1-2, Zoology 1-2†. (b) Chemistry 11-12, Geology 1-2, Physics 11 and 12 or 11 and 14..... | 18 to 22 |
| | (In satisfying this requirement, at least one year-course must be taken in each group (a) and (b).) | |
| Social Studies | Economics 1-2; Geography 51, 52; History 39-40, 71-72; Political Science 1 and 9, 1 and 10, or 9-10; or Sociology and Anthropology 1-2..... | 6 |
| Elective* | | 2 to 6 |
| Total | | 64 |

2. PREMEDICAL

The first 60 semester hours of the 90 required for admission to the School of Medicine are undertaken in the Junior College. Premedical students may follow

* It is suggested that electives include one of the following courses: Art 31-32, 71-72; Philosophy 51-52, 111-12; Religion 9-10, 59-60.

The student should obtain the advice of his major department as to proper prerequisite and collateral courses for the intended major.

Credit is not given for courses elected in Secretarial Studies; credit may be given for a limited number of courses elected in Physical Education, with the approval of the Dean.

† Students enrolled in the Medical Technology program may add Microbiology 112 to this group.

either the Arts and Letters curriculum or the Science curriculum listed above. They should, however, note the specific requirements for admission to the School of Medicine. (See Admission, pages 12 and 13.) Each premedical program must be approved by the Premedical Adviser.

4. MEDICAL TECHNOLOGY

The degree of Bachelor of Science in Medical Technology is offered by Columbian College in collaboration with the Department of Pathology and the University Hospital. Candidates should follow the Science curriculum in the Junior College, including specifically Chemistry 11-12, Zoology 1-2, and Microbiology 112. See pages 85 and 86 for a description of the course and a statement of further requirements. Specific degree requirements are stated under the Department of Pathology following the listing of the Staff of Instruction.

B. SCHOOL OF PHARMACY:

The following two-year curriculum prepares for the five-year Bachelor of Science in Pharmacy curriculum (see pages 118-19) in the School of Pharmacy.

| | Semester Hours |
|---|-------------------|
| English Composition and Literature English 1 or 1X; 51-52, 71-72, 91-92, Classical Languages 71-72, French 51-52, German 51-52, Slavic Languages 91-92, or Spanish 51-52; English 4..... | 12 |
| Physical Education See page 43 for statement of requirement..... | 4 |
| Science Chemistry 11-12, 151-52; Physics 11, 12; Botany 1; Zoology 2 | 29 |
| Social Studies Economics 1 | 3 |
| Mathematics Mathematics 3 or elective..... | 3 |
| Professional Courses ... Pharmacy 1 | 1 |
| Elective* | 12 |
| Total..... | 64 |

C. SCHOOL OF EDUCATION:

1. EDUCATION

The following two-year curriculum prepares for the Bachelor of Arts in Education curriculum in the School of Education:

| | | |
|-------------------------|--|------|
| English | English 1 or 1X, 2..... | 6 |
| Foreign Language | English 51-52, 71-72, or 91-92..... | 6 |
| | (French, German, Latin, Russian, or Spanish.) See page 51 for foreign language requirement..... | 12 |
| Physical Education | See page 43 for statement of requirement..... | 4 |
| Science | Three semesters (two in biological science and one in physical science or vice versa) to supplement senior high school courses in those fields and chosen from Biology 1-2; Botany 1-2; Chemistry 3-4, 11-12; Geology 1-2; Physics 11-12; Zoology 1-2. (A student offering for admission two or more acceptable senior high school units in the above areas of science may be exempted from one semester of this requirement.) | 9-12 |

* Credit is not given for courses elected in Physical Education or Secretarial Studies.

| | Semester Hours | |
|----------------------|---|-----|
| Mathematics | One semester to supplement senior high school courses, chosen from Mathematics 2, 3, 6, 12..... | 3 |
| Social Studies | History 71-72; Political Science 1 and 9, 1 and 10, or 9-10 | 6 |
| | Economics 1-2; Geography 51-52; History 39-40, 71- 72; Political Science 1 and 9, 1 and 10, 9-10; Re- ligion 59-60; Sociology and Anthropology 1-2. (A student offering for admission two or more accept- able senior high school units in social studies may be exempted from this requirement.)..... | 6 |
| Speech | Speech 1 (or 11, if the Department so advises)..... | 3 |
| Psychology | Psychology 1, 22..... | 6 |
| Elective | | 0-3 |
| Total..... | | 64 |

2. HOME ECONOMICS

The following two-year curriculum prepares for the Bachelor of Science in Home Economics curriculum in the School of Education:

| | | |
|---------------------------|---|-----|
| English | English 1 or 1X, 2..... | 6 |
| | English 51-52, 71-72; Speech 1-2, or 1 and 11..... | 6 |
| Physical Education | See page 43 for statement of requirement..... | 4 |
| Psychology | Psychology 1, 29..... | 6 |
| Science | Biology 1-2, Chemistry 11-12, Physics 11, 12..... | 6-8 |
| Social Studies* | Economics, History, Political Science, or Sociology and Anthropology | 12 |
| Major Prerequisites | Home Economics 1, 22 (Freshman year)..... | 6 |
| | Home Economics 51, 62 (Sophomore year)..... | 6 |
| Academic Electives | (Freshman year) | 9 |
| | (Sophomore year) | 3 |
| Total..... | | 64 |

3. PHYSICAL EDUCATION FOR MEN

The following two-year curriculum prepares for the Bachelor of Science in Physical Education curriculum in the School of Education:

| | | |
|---------------------------|--|--------|
| English | English 1 or 1X, 2..... | 6 |
| Science | Biology 1-2 or Zoology 1-2 (Freshman year)..... | 6 or 8 |
| | Chemistry 3-4 (Sophomore year)..... | 8 |
| Social Studies | History 71-72; Political Science 1 and 9, 1 and 10, or 9-10 | 6 |
| | Sociology and Anthropology 1-2..... | 6 |
| Major Prerequisites | Physical Education 41, 43-44, 47; Speech 1 or 11 (Freshman year) | 10 |
| | Physical Education 45-46, 49, 50, 58; Psychology 1, 22 (Sophomore year) | 18 |
| Elective | | 2-4 |
| Total..... | | 64 |

4. PHYSICAL EDUCATION FOR WOMEN

The following two-year curriculum prepares for the Bachelor of Science in Physical Education curriculum in the School of Education:

| | | |
|---------------|-------------------------------------|---|
| English | English 1 or 1X, 2..... | 6 |
| | English 51-52, 71-72, or 91-92..... | 6 |

* Courses are to be selected with the approval of the adviser in the Department of Home Economics.

| | Semester Hours |
|--|-------------------|
| Physical Education 1-2, 11-12 | 4 |
| Science Biology 1-2 or Zoology 1-2 (Freshman year)..... | 6 or 8 |
| Chemistry 3-4 (Sophomore year) | 8 |
| Social Studies History 39-40, 71-72; Political Science 1 and 9, 1 and 10, or 9-10; or Sociology and Anthropology 1-2... | 6 |
| Major Prerequisites Physical Education 43-44 (Freshman year) | 4 |
| Physical Education 49, 50, 51-52; Psychology 1, 22 (Sophomore year) | 16 |
| Academic Electives | 6 or 8 |
| Total..... | 64 |

D. SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS:

1. ACCOUNTING AND BUSINESS ADMINISTRATION

The following two-year curriculum prepares for the Bachelor of Business Administration curricula in Accounting and in Business Administration in the School of Government, Business, and International Affairs:

| | | |
|--------------------------|---|----|
| Accounting | Accounting 1-2 | 6 |
| English | English 1 or IX, 2, 11 | 9 |
| Foreign Language | See page 51 for foreign language requirement | 12 |
| Physical Education | See page 43 for statement of requirement | 4 |
| Social Studies | Economics 1-2; Political Science 1 and 9, 1 and 10, or 9-10 | 12 |
| Speech | Speech 1 | 3 |
| Statistics | Statistics 51, 52 | 6 |
| Elective* | (Students interested in Foreign Commerce include Geography 51) | 12 |

Total..... 64

2. INTERNATIONAL AFFAIRS AND PUBLIC AFFAIRS

The following two-year curriculum prepares for the Bachelor of Arts in Government curricula in International Affairs and Public Affairs in the School of Government, Business, and International Affairs:

| | | |
|--------------------------|--|--------|
| English | English 1 or IX, 2 | 6 |
| Foreign Language | See page 51 for foreign language requirement | 12 |
| Mathematics, Science .. | Biology, Botany, Chemistry, Geology, Mathematics, Physics, Statistics, or Zoology | 6 to 8 |
| Physical Education | See page 43 for statement of requirement | 4 |
| Social Studies | Economics 1-2; History 39-40, 71-72; Political Sci- ence 1 and 9, 1 and 10, or 9-10 | 24 |
| Elective* | (To satisfy minimum required credits. Students in- terested in Foreign Service include Geography 51) 10 to 12 | |

Total..... 64

3. BUSINESS AND ECONOMIC STATISTICS

The following two-year curriculum prepares for the Bachelor of Business Administration curriculum in the field of Business and Economic Statistics in the School of Government, Business, and International Affairs:

| | | |
|------------------|--------------------------|---|
| Accounting | Accounting 1-2 | 6 |
| Economics | Economics 1-2 | 6 |
| English | English 1 or IX, 2 | 6 |

* Credit is not given for courses listed in Physical Education or Secretarial Studies.

| | Semester Hours |
|--|-------------------|
| Foreign Language See page 51 for foreign language requirement..... | 12 |
| Mathematics Mathematics 12, 29, 30..... | 9 |
| Physical Education See page 43 for statement of requirement..... | 4 |
| Political Science Political Science 9-10 | |
| or Philosophy Philosophy 51-52 | 6 |
| Statistics Statistics 51 or 91, 52..... | 6 |
| Elective* | 9 |
| Total..... | 64 |

II. VOCATIONAL CURRICULA

In addition to the above curricula, all of which prepare for admission to upper division colleges and schools, the Junior College offers the following two-year terminal courses.

The curricula in Accounting and Secretarial Studies lead to the degree of Associate in Arts. The curricula in Home Economics and Physical Sciences lead to the degree of Associate in Science.

1. ACCOUNTING

The required work may be completed in two calendar years on a full-time basis or in three calendar years on a part-time basis, with the approval of the adviser.

| | | |
|-------------------------------|---|----|
| Accounting | Accounting 1-2, 101, 111, 121-22, 161, 171, 181, 191, 193 | 33 |
| Business Administration | Business Administration 131, 161, 162..... | 9 |
| Economics | Economics 1-2 | 6 |
| English | English 1 or IX, 2..... | 6 |
| Physical Education | See page 43 for statement of requirement..... | 4 |
| Elective | To be selected with the approval of the adviser..... | 6 |
| Total..... | | 64 |

2. HOME ECONOMICS

| | | |
|--------------------------------|--|------|
| English | English 1 or IX, 2..... | 6 |
| | English 51-52, 71-72, 91-92, Russian 91-92; Speech 2 (1, 11) | 6 |
| | English 11 or Secretarial Studies 51..... | 3 |
| Home Economics | Home Economics 1, 22, 51, 62..... | 12 |
| Physical Education | See page 43 for statement of requirement..... | 4 |
| Psychology | Psychology 1 | 3 |
| Secretarial Studies | Secretarial Studies 1, 2..... | 6 |
| Home Economics Elective† | | 6-12 |
| Elective* | | 6-12 |
| Total..... | | 64 |

3. PHYSICAL SCIENCES

This curriculum is designed for part-time students who do not wish to extend their collegiate education beyond 64 semester hours of work. All other students interested in the study of physical science should follow the pre-Columbian College Science curriculum.

| | | |
|-----------------|-----------------------------|----|
| Chemistry | Chemistry 11, 12, 21..... | 12 |
| English | English 1 or IX, 2, 11..... | 9 |

* Credit is not given for courses elected in Physical Education or Secretarial Studies.
† Courses are to be selected with the approval of the adviser in the Department of Home Economics.

| | Semester Hours |
|--|-------------------|
| Mathematics Mathematics 3, 6, 12, 29, 30, 31..... | 12-18 |
| Mechanical Engineering..... Mechanical Engineering 10..... | 2 |
| Physical Education See page 43 for statement of requirement..... | 4 |
| Physics Physics 11, 12, 13, 16, 55..... | 15 |
| Elective (Speech 1, Economics 1-2 suggested)..... | 4-10 |
| Total..... | 64 |

4. SECRETARIAL STUDIES

| | | |
|----------------------------|---|----|
| English | English 1 or 1X, 2..... | 6 |
| | English 51-52, 71-72, 91-92, Russian 91-92..... | 6 |
| Physical Education | See page 43 for statement of requirement..... | 4 |
| Secretarial Studies* | Secretarial Studies 1, 2, 11, 12, 15, 16, 51, 54..... | 24 |
| Social Studies | Economics 1-2, Geography 51, 52, History 39-40, 71-72, Political Science 1 and 9, 1 and 10, or 9-10, or Sociology and Anthropology 1-2..... | 6 |
| Accounting | Accounting 1 | 3 |
| Speech | Speech 11 | 3 |
| Elective | To be selected with the approval of the adviser..... | 12 |
| Total..... | | 64 |

Examinations for Waiving Curriculum Requirements†

A required course may be waived and admission to an advanced course granted by the satisfactory passing of a waiver examination prescribed by the department concerned. Passing this examination does not entitle the student to any hours of credit toward the degree. Written request to take the examination should be made to the Dean and the required fee paid at the Office of the Cashier before the date specified in the University calendar.

Advanced Placement Tests

Upon recommendation of the appropriate department(s), a maximum of 30 semester hours of credit may be granted for college level work which has been taken in a secondary school and substantiated by the Advanced Placement Test(s) of the Educational Testing Service. A department may, at its discretion, withhold credit until the student has successfully completed higher work in the same discipline at this University.

HONORS

The degree of Associate in Arts or Associate in Science may be conferred "with distinction" upon the student who has a quality-point index of 3.50 or higher, provided that student has been in residence at the University for 30 hours, 15 of which must have been taken in the Junior College at the time the index is calculated.

* Qualified students, upon the approval of the adviser or the satisfactory completion of a placement test, may waive Secretarial Studies 1, 11, and 12. Other courses, approved by the adviser, will be substituted.

† This provision does not apply to the premedical student, all of whose required premedical work must be taken in a recognized college of arts and sciences.

COLUMBIAN COLLEGE

THE FACULTY AND STAFF OF INSTRUCTION*

C. D. Linton, *Dean*; C. W. Pettit†, *Assistant Dean*; R. W. Stephens, *Acting Assistant Dean* (spring semester)

Professors P. W. Bowman, J. W. Brewer, H. F. Bright, A. E. Burns, R. D. Campbell, J. H. Coberly, C. W. Cole, R. H. Davison, Mitchell Dreese, C. E. Gauss, H. L. Geisert‡, Wood Gray, A. M. Griffin, I. B. Hansen, G. F. Henigan, Jr., C. A. M. Hogben, Thelma Hunt, Herbert Jehle, E. H. Johnson, F. E. Johnston, E. L. Kayser, J. W. Kendrick, D. C. Kline, G. M. Koehl, W. H. Kraus, J. F. Latimer, C. E. Leese, L. P. Leggette, W. K. Legner, C. D. Linton, T. P. G. Liverman, W. A. MacDonald, G. E. McSpadden, Florence Mears, H. M. Merriman§, R. H. Moore, Edith Mortensen, C. R. Naeser, N. D. Nelson, C. W. Pettit†, M. I. Protzman, Gretchen Rogers, W. F. Sager, R. P. Schlabach, Jr., Wilson Schmidt†, E. S. Shepard§, J. R. Sizoo, Lewis Slack, R. B. Stevens, Geza Teleki, I. R. Telford, F. S. Tupper, B. D. Van Evera, R. C. Vincent, D. S. Watson, W. R. West, N. A. Wiegmann, R. E. Wood, S. N. Wrenn.

Associate Professors J. G. Allee, Jr.¶, W. E. Caldwell†, W. G. Clubb, W. C. Davis, A. H. Desmond, J. W. Harkness, R. C. Haskett†, P. H. Highfill, Jr., C. W. Hill, H. Hobbs, Rudolph Hugh, Eva Johnson, J. C. King, Virginia Kirkbride, H. L. LeBlanc, L. P. Leite, W. L. Marsh, G. E. Mazzeo, C. Y. Meade, J. N. Mosel, S. C. Munson, Benjamin Nimer, C. E. Olmstead, T. P. Perros, J. P. Reesing, Jr., J. W. Robb, William Schmidt, J. W. Skinner, R. W. Stephens, E. L. Stevens, Rafael Supervia§, R. B. Thompson, C. E. Tuthill, R. D. Walk, R. H. Walker, Jr., H. W. Westermann, D. G. White, R. C. Willson, Helen Yakobson

Assistant Professors J. M. Campbell, Percy Crosby, J. T. Davis, J. A. Frey, R. G. Jones, Carlos Lozano, H. R. Ludden, J. L. Metivier, Jr., H. D. Osterle, E. E. Pantzer III, R. H. Schlagel, W. A. Smith, R. Z. Vause, S. S. Yeandle, Jr.

COMMITTEES#

THE DEAN'S COUNCIL**

1962: A. H. Desmond, R. C. Vincent; 1963: Gretchen Rogers, W. F. Sager;
1964: R. C. Haskett, C. E. Tuthill

COMMITTEE ON ADMISSIONS AND ADVANCED STANDING

C. W. Pettit (*Chairman*), Edith Mortensen (*Secretary*), C. W. Cole, J. W. Kendrick, W. F. Sager

COMMITTEE ON THE USE OF CORRECT ENGLISH

R. H. Moore (*Chairman*), J. G. Allee, Jr., G. F. Henigan, Jr., Muriel McClanahan, R. C. Willson

* The President of the University, the Dean of Faculties, the Dean and Assistant Dean of the College, the Registrar of the University, the Director of Admissions of the University, Professors, Associate Professors, and Assistant Professors constitute the Faculty.

† This listing of Faculty and Staff of Instruction is for the academic year 1960-61.

‡ On sabbatical leave spring semester 1960-61.

§ On leave of absence fall semester 1960-61.

¶ On sabbatical leave fall semester 1960-61.

§ On sabbatical leave summer 1961.

** The Dean of Columbia College is a member ex officio of all committees.

** Elected by the Faculty.

COMMITTEE ON SCHOLARSHIP

Florence Mears (*Chairman*), W. G. Clubb, H. M. Merriman, J. P. Reesing, Jr., S. N. Wrenn

COMMITTEE ON STUDIES

C. D. Linton (*Chairman*), R. C. Haskett, Edith Mortensen, William Schmidt, F. S. Tupper

GENERAL INFORMATION

INTRODUCTORY

Columbian College was founded in 1821. James Monroe, then President of the United States, aided in obtaining the charter from Congress which established "The Columbian College in the District of Columbia" for the "sole and exclusive purpose of educating youth in the English, learned and foreign languages, the liberal arts, sciences and literature", with full power to confer all degrees "usually granted and conferred in colleges".

In 1930, when the Junior College was established, the name "Columbian College" was bestowed upon the senior college of liberal arts.

THE COLUMBIAN COLLEGE PROGRAM

Columbian College is that branch of the University which grants the Bachelor's and Master's degrees in the liberal arts. Its purpose is to enable the student to develop harmoniously both his particular abilities and his general awareness as a human being. It demands of the student a thorough acquaintance with one major area of learning and at the same time an understanding of how that field of specialization fits into the larger context of the scientific, social, and moral problems which confront modern man. It stresses not merely expertness but that broadly enlightened expertness which encourages its graduates to grow through the years in ability and wisdom.

The program is a contemporary application of the historic liberal arts tradition. A particular vitality and meaning are imparted to it by the fact that The George Washington University is situated in the cosmopolitan capital city of a nation to which, increasingly, the world looks for leadership. Here the liberal arts tradition is put to the test of contact with reality.

REGULATIONS

Students in Columbian College are subject to, and are expected to familiarize themselves with, the regulations regarding ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 9-23, and the University regulations stated on pages 40-46.

PREREQUISITES

It is assumed that a student entering Columbian College has met the requirements of the Junior College under the *Arts and Letters* curriculum or the *Science* curriculum. (See the Junior College section of the CATALOGUE.) Following is a summary of these prerequisites:

The *Arts and Letters* curriculum: (1) English composition (6 semester hours) and an additional year course (6 semester hours) in English, American, European, Classical, or any other foreign literature. (2) Two college years (at least 12 semester hours) of a single foreign language or the equivalent (see foreign-language requirement, page 51), are required. A transfer student who has had foreign-lan-

guage courses in another institution meeting 4 or 5 times a week may have acquired as much as 12 semester hours in a foreign language without having taken four semesters (two full years). Such a student is required to take additional work here in the same language until he has completed four semesters (or an equivalent combination of high school years and college semesters). (3) At least one year (6 semester hours) in social studies, chosen from first-group courses in History, Political Science, Economics, Sociology and Anthropology, or Geography, is required. (4) At least one year (6 or 8 semester hours) of a laboratory science (Biology, Botany, Chemistry, Geology, Physics, or Zoology) is required.

The remaining hours of the Junior College program (roughly a minimum of 22 to 24 hours) should be devoted to the prerequisite courses required by the prospective major department (as stated following the departmental staff in the courses of instruction section of the CATALOGUE) or recommended by the advisers in the field-of-study major (see pamphlets prepared by the respective advisers), together with appropriate electives. Electives in Art, Philosophy, or Religion are recommended.

The Science curriculum requirements in English are the same as those of the Arts and Letters curriculum. A year course of social study is required. The foreign-language requirement is the same as for the Arts and Letters curriculum, except that French, German, or Russian is specified. At least 6 semester hours in Mathematics must be taken; additional work in Mathematics is required of prospective majors in Chemistry or Physics. In science, the student should take courses in both biological and physical sciences, bearing in mind the prerequisites stated by the department under which he expects to major, as well as specified prerequisites in certain departments (such as Mathematics and Chemistry for majors in Physics, or Mathematics and Physics for majors in Chemistry).

A transfer student admitted to Columbian College with deficiencies in freshman or sophomore work (whether in amount or in distribution of courses), corresponding to the programs outlined above, is required to begin to make up such deficiencies immediately upon admission to Columbian College, and to carry courses toward this end each semester until all the general education requirements described above are satisfied. Students transferring from the School of Government, Business, and International Affairs must complete pre-Columbian College requirements in science and in literature as prescribed in the Arts and Letters curriculum. Electives in Art, Philosophy, or Religion are recommended.

AMOUNT OF WORK

A full-time student who is not on probation may take ordinarily not more than 17 semester hours. A student employed more than 24 hours a week, who is not on probation, may take not more than 10 hours.

A full-time student whose quality-point index is 3.50 or higher may take not more than 19 hours. An employed student who meets the same standard may take not more than 12 hours.

A student who accepts employment after registration or at any time during a semester must report that fact immediately to the Dean so that his program may be adjusted, if necessary.

ATTENDANCE

The student is held responsible for all the work of the courses in which he is registered, and all absences must be excused by the instructor in charge before provi-

sion is made for the student to make up the work missed. Excessive absence in any course will lead to loss of credit in that course, even though other requirements, such as tests, term papers, and examinations, are met.

CLASSIFICATION OF STUDENTS

A student who has completed less than 30 semester hours in Columbian College, and who has registered his major at the Office of the Registrar is classified a *junior*. A student who has completed 30 hours in Columbian College, including at least one course in his major, is classified a *senior*. A student who has satisfactorily completed the work for the Bachelor's degree, and whose program of study has been approved and filed in the Office of the Registrar, is classified a *master in course*.

INDEPENDENT STUDY PLAN

A student of demonstrated capacity, with special interest in the subject matter of a course, may be permitted to undertake independent study under the personal direction of an instructor, in accordance with the rules of the department or departments concerned. Credit under this plan is limited to the specific course-credits as designated in the list of courses of instruction in the CATALOGUE.

CORRESPONDENCE AND HOME-STUDY COURSES

No credit is given for work done by correspondence or in home-study courses.

THE BACHELOR'S DEGREES

Columbian College offers programs leading to the degrees of Bachelor of Arts, Bachelor of Science, and Bachelor of Science in Medical Technology.

In cooperation with the School of Medicine a seven-year curriculum leading to the combined degrees of Bachelor of Arts and Doctor of Medicine is offered.

REQUIREMENTS FOR THE DEGREES

RESIDENCE

For the residence requirement, see pages 43-44. Students intending to transfer to Columbian College from a nondegree-granting division of the University should note specifically the regulation concerning transfer within the University (see page 42).

SCHOLARSHIP

The system of grading and of computing scholarship is described in detail on pages 40 and 41.

In order to graduate, a student must have a general quality-point index of at least 2.00. In addition, the student with a Departmental Major must have an index of at least 2.50 in his major subject. Grades in courses taken at other institutions are not considered in computing the quality-point index. The student with a Field-of-Study Major meets the qualitative requirement by passing the Major Examination.

In computing the index in the major, all second-group and third-group courses in the major field taken at this University are included, even though minimum requirements for the major may have been exceeded, except when registration for graduate credit is approved. Grades received in first-group courses are not considered.

Probation.—A student must maintain a quality-point index of at least 2.00, or be

placed on probation. He remains on probation as long as his index is below 2.00, or until his probation is removed by the Committee on Scholarship.

Suspension.—A student whose index falls below 1.50 or who is placed on probation for a third semester, whether successive or after an interval, is suspended.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. He must then submit evidence to the Committee on Admission and Advanced Standing that during his absence from the University he has so conducted himself as to indicate that he will profit by readmission. A student suspended twice for poor scholarship will not be readmitted.

The foregoing scholarship rules are applied to a student with a limited schedule only when he has undertaken a minimum of 15 semester hours.

CURRICULUM REQUIREMENTS

The curriculum requirements for the Bachelor's degrees include at least 60 semester hours beyond those of the Junior College (the curriculum in *Arts and Letters* or in *Science*) and the satisfactory completion of the major. Each program must be approved by the major adviser and by the Dean.

At least 24 of the last 60 hours counted toward the Bachelor's degree must be taken in subjects* not included in the major field or department. The student should consult his major adviser at each registration concerning his choice of electives.

Except for students registered for the combined degrees of Bachelor of Arts and Doctor of Medicine, or for the degree of Bachelor of Science in Medical Technology, not more than 12 semester hours of professional courses may be included in the 124 hours required for the Bachelor's degrees in Columbian College. Columbian College students electing professional courses under this rule must obtain the approval, in advance, of the Dean's Council of Columbian College. Ordinarily courses in Physical Education, Secretarial Studies, and technical courses in Education will not be approved for credit toward a degree in Columbian College.

A change in degree candidacy (e.g., from Bachelor of Arts to Bachelor of Science) requires the permission of the Dean. The degree requirements effective at the time the change is approved must be met.

Each student must select and file with the Registrar a choice of major upon entering Columbian College. He may change the major only with the consent of the Dean and of the department or committee concerned, and must meet the requirements for the new major which are in effect at the time the change is approved.

First-group courses may be required as prerequisites to undergraduate major programs, but because of their introductory character may not be counted as part of such programs. (See "Explanation of Course Numbers.")

Students transferring from other institutions or from other schools, colleges, or divisions in this University with major requirements wholly or substantially met must complete satisfactorily at least 12 semester hours of approved work in the major field in Columbian College. This work will count as part of the minimum residence requirement.

Examination for Waiving Curriculum Requirements.—A required course may be waived and admission to an advanced course granted by the satisfactory passing of a

* Art, Biology, Botany, Chemistry, Classical Languages and Literatures, Economics, English, Geography, Geology, Germanic Languages and Literatures, History, Journalism, Mathematics, Philosophy, Physics, Political Science, Psychology, Religion, Romance Languages and Literatures, Slavic Languages and Literatures, Sociology and Anthropology, Speech, Statistics, Zoology.

waiver examination prescribed by the department concerned. Passing this examination does not entitle the student to any hours of credit toward the degree. Written request to take the examination should be made to the Dean and the required fee paid at the Office of the Cashier before the date specified in the University calendar.

Use of Correct English.—Any student whose English in any course whatever is deemed unsatisfactory may be reported by the instructor to the Dean and to the Committee on the Use of Correct English. The Chairman of the Committee may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed by failure to make up any such deficiency in English to the satisfaction of the Committee and the Dean.

GRADUATE RECORD EXAMINATIONS

During the final semester of the senior year students in Columbian College are required to take the following Graduate Record Examinations: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and Area Tests (achievement), which measure breadth of knowledge and understanding in three broad areas of the liberal arts: Natural Science, Social Science, and the Humanities. (For further information concerning the Graduate Record Examinations, see page 44.)

BACHELOR OF ARTS

The work of the junior and senior years, including a major in one of the following fields, must be approved by the major adviser and by the Dean.

Major Fields.—American Thought and Civilization; Art (1) Art History and Theory, (2) Drawing and Painting, (3) Sculpture, and (4) Commercial Art; Biology; Botany; Chemistry; Economics; English Literature; French Language and Literature; Geography; Geology; Germanic Languages and Literatures; History; Journalism; Latin American Civilization; Mathematical Statistics; Mathematics; Philosophy; Physics; Political Science; Psychology; Religion; Russian; Sociology and Anthropology; Spanish American Literature; Spanish Language and Literature; Speech (Speech or Dramatic Art); Zoology.

Combined Degrees of Bachelor of Arts and Doctor of Medicine.—A candidate for the combined degrees of Bachelor of Arts and Doctor of Medicine must: (1) complete the Medical School entrance requirements (see page 12); (2) fulfill the Junior College Arts and Letters requirements (see pages 51–52); (3) fulfill the Columbian College residence requirement of at least 30 semester hours; (4) obtain the approval of the Dean of Columbian College at the time of entering the School of Medicine; (5) obtain the recommendation of the Dean of the School of Medicine at the completion of all prescribed courses in the first year of the School of Medicine, at which time the degree of Bachelor of Arts will be conferred (professional work taken at another institution will not satisfy the major requirement for the combined degrees); (6) maintain throughout the entire course the scholarship level required for graduation.

BACHELOR OF SCIENCE

The work of the junior and senior years, including a major in one of the following sciences, must be approved by the major department or division and by the Dean.

Biological Sciences: Biology, Botany, Zoology. *Physical Sciences:* Chemistry, Geology, Mathematical Statistics, Mathematics, Physics.

THE UNDERGRADUATE MAJOR

There are two types of undergraduate majors: the field-of-study major and the departmental major.

THE FIELD-OF-STUDY MAJOR

Each Field-of-Study Major covers a carefully worked out field of coordinated study and is under the supervision of the appropriate department and the Columbian College Committee on Studies.

The *Field-of-Study Major* requires no specific number of semester hours, no specific program of courses, and no specific quality-point index for the major, although the student is required to meet the over-all general requirements for the degree (at least 124 semester hours with a quality-point index of at least 2.00). Ability to pass the Major Examination is assumed to be a convincing demonstration that the student possesses the breadth, depth, and quality of knowledge of his major usually defined in terms of semester hours, courses, grades, and a better-than average quality-point index. A pamphlet on each field is obtainable either from the appropriate adviser or from the Office of the Dean. The prospective student should place himself under the direction of the appropriate adviser immediately upon completing Junior College work and beginning his junior year (the first senior-college year) in Columbian College.

The Field-of-Study Major places special emphasis on the intellectual development of the individual student. Programs in the same major may vary, depending upon the individual student's background, previous study, reading habits, and aptitudes. The student is expected to consult his adviser frequently, and the special proseminar offered in the field gives him further opportunity for individual advice and direction in pursuing a program especially adapted to his needs and abilities. A close student-adviser relationship is essential for the student's success under the Field-of-Study Major plan.

The following Field-of-Study Majors are offered: American Thought and Civilization, Biology, English Literature, French Language and Literature, History, Latin American Civilization, Mathematical Statistics, Philosophy, Spanish American Literature, Spanish Language and Literature, Zoology.

The major in Biology extends broadly over the field of Biological Sciences and those in American Thought and Civilization and in Latin American Civilization involve studies in two areas, those of Languages and Literatures and of Social Sciences. The other Field-of-Study Majors, with the exception of the major in Spanish American Literature, replace departmental majors in their respective fields. A candidate for a Bachelor's degree with a major in Biology, English Literature, French Language and Literature, History, Mathematical Statistics, Philosophy, Spanish American Literature, Spanish Language and Literature, or Zoology must elect a Field-of-Study Major.

Proseminar in the Major

A proseminar is offered in each field to help the student in his reading, study, and laboratory exercises acquire a coordinated knowledge of his field. It is a presentation of the content and methods of the major field as a whole through the organization and coordination of the knowledge obtained in the various formal courses in the major subject and of material not usually included in such courses. This course is not required. Six semester hours, but no qualitative grade, may be assigned. When registered in this course, the student has the privilege of visiting, subject to the approval of the instructor, any other appropriate course offered in the College. (Reg-

ular attendance in a course, either for credit or as an auditor, requires registration and payment of tuition.) Proseminars are open only to the student who has been accepted as a candidate under that specific major.

The Major Examination

The Major Examination will normally be taken at the close of the senior year; a student on a limited schedule, may take it no earlier than one calendar year before graduation. A student who fails to pass a Major Examination may, at the discretion of the Committee on Studies, be reexamined at a later regular major-examination period. The Committee on Studies has general supervision of the preparation, reading, and grading of Major Examinations. Major Examinations are held each semester on dates fixed by the department or departments concerned, but in no case later than January 15 for the fall semester, May 15 for the spring semester, and August 7 for the summer session.

DEPARTMENTAL MAJORS

Departmental Majors, unlike *Field-of-Study Majors*, are defined in terms of credit hours, required courses, and the attainment of a quality-point index of at least 2.50 in all second-group courses taken in the major field. The minimum specific requirements for Departmental Majors are listed below the staff of instruction of the department concerned in the section of the CATALOGUE devoted to courses of instruction. The Executive Officer of the Department, or designated departmental adviser, should be consulted at registration concerning the student's program of courses; and the entire program, including electives, must be approved by the Department. The student is also expected to consult the Executive Officer or adviser in all matters affecting his program of studies, such as changes, substitutions, or withdrawals, and especially concerning his progress in his courses. As far as possible the close student-adviser relationship developed in the *Field-of-Study Major* will be cultivated also in *Departmental Majors*.

Departmental Majors are offered in the following: Art (1) Art History and Theory, (2) Drawing and Painting, (3) Sculpture, and (4) Commercial Art; Botany; Chemistry; Economics; Geography; Geology; Germanic Languages and Literatures; Journalism; Mathematics; Physics; Political Science; Psychology; Religion; Russian; Sociology and Anthropology; Speech (Speech or Dramatic Art).

BACHELOR OF SCIENCE IN MEDICAL TECHNOLOGY

In cooperation with the University Hospital and the Department of Pathology of the School of Medicine, Columbian College offers work leading to the degree of Bachelor of Science in Medical Technology.

A candidate for this degree must fulfill the Junior College Medical Technology Curriculum (see page 53); fulfill the Columbian College requirements for degrees, including the residence requirement of at least 30 semester hours; complete the twelve-month Medical Technology Course in the University Hospital; and maintain throughout the entire course the scholarship level required for graduation.

Admission to the Columbian College degree program does not assure acceptance in the Hospital program. For further information, see pages 85 and 86.

THE MASTER'S DEGREES

Columbian College offers programs leading to the degrees of Master of Arts, Master of Science, and Master of Fine Arts.

DEFINITION OF THE MASTER'S WORK

The study leading to the Master's degree is a comprehensive survey of a field of knowledge. It is a continuation of the work of the student's undergraduate major and involves a great acquaintance with scholarly method.

The student must satisfy certain minimum requirements as to preparation, residence, ability to read an approved modern foreign (European) language, and courses taken; but these requirements, while essential, are regarded primarily as qualifying measures. The student's knowledge of his field, as demonstrated by his thesis and by the results of his Master's Examination (together with such other examination involving special skills or techniques as the department or the Columbian College Committee on Studies may require), is the basis upon which the Master's degree is conferred.

MASTER OF ARTS

Graduate work leading to the degree of Master of Arts is offered in the following fields:

American Literary and Cultural History, Art History and Criticism, Biochemistry, Biology, Botany, Chemistry, Chemotherapy, Economics, English and American Literature, English Literature, French Language and Literature, Geography, Geology, Germanic Languages and Literatures, History, Latin American Civilization, Mathematical Statistics, Mathematics, Microbiology, Painting, Pharmacology, Philosophy, Physics, Physiology, Political Science, Psychology, Religion, Religious Education, Sculpture, Sociology and Anthropology, Spanish American Literature, Spanish Language and Literature, Speech Correction, Zoology.

Special programs involving coordinated work in two or more departments may be arranged with the approval of the departments concerned and the Columbian College Committee on Studies.

MASTER OF SCIENCE

Graduate work leading to the degree of Master of Science is offered in the following fields:

Anatomy, Biochemistry, Biology, Botany, Chemistry, Chemotherapy, Geology, Mathematical Statistics, Mathematics, Microbiology, Pharmacology, Physics, Physiology, Psychology, Zoology.

Special programs involving coordinated work in two or more departments may be arranged with the approval of the departments concerned and the Columbian College Committee on Studies.

MASTER OF FINE ARTS

Graduate work is offered leading to the degree of Master of Fine Arts in the fields of painting and sculpture (see the Department of Art) and in the field of Dramatic Art (see the Department of Speech).

REQUIREMENTS FOR THE DEGREES

RESIDENCE

Normally, an academic year of residence in Columbian College is required, i.e., completion of a minimum of 30 semester hours of work including the thesis, which is counted as the equivalent of 6 semester hours of course work. Summer work may be counted in residence, but in no case may the period of residence aggregate less than twenty-seven weeks. Not more than 12 semester hours (which must be approved in advance by the Dean) may be taken in another school or division of this Univer-

sity, and such work may not be counted toward both a degree in that school or division and the Master's degree in Columbian College. *No part of the minimum requirement may be taken elsewhere.* All work for the degree of Master of Arts, Master of Science, or Master of Fine Arts must be completed within a maximum of three years, unless the Dean's Council considers the circumstances so unusual as to justify an extension of time.

SCHOLARSHIP

The grade of *E* (excellent) must be attained in at least 6 semester hours of the course requirements for the degree.

A student whose scholarship is unsatisfactory may be suspended by the Dean upon recommendation of the department under which the student is working. A Master's candidate who accumulates 9 hours or more of *U* (unsatisfactory) (including grades of *C* or lower in prerequisite courses) will be automatically suspended. Regarding the system of grading, see pages 40 and 41.

PROGRAM OF STUDIES

The student's program of studies must be outlined in detail at the beginning of his work, in triplicate, on forms available at the Office of the Dean. Each program is subject to the approval of the department and the appropriate member of the Committee on Studies. The program may be revised, but any change necessitates a repetition of the procedures just described.

The candidate for the Master's degree ordinarily may specialize exclusively in the field of his choice. Any student, however, whose undergraduate training does not include at least one full year of work in each of the following areas of study: (1) mathematics or science (with or without laboratory), (2) social science, and (3) the humanities (literature, philosophy, art, music, or religion), must make up this deficiency in his general education before being admitted to candidacy for the Master of Arts degree. This last provision does not apply to candidates for the Master of Science degree.

Courses numbered from 1 to 100 may not be credited toward the Master's degrees, but may in certain instances be required as a basis for advanced work. At least 6 semester hours of the course work required for the degree must be taken in courses numbered over 200. Courses numbered between 100 and 200 may be credited toward the degree, if completion of additional work has been certified by the appropriate officer of instruction. (See "Explanation of Course Numbers".)

A student who expects to continue his studies for the degree of Doctor of Philosophy after receiving the Master's degree is strongly advised to plan his program from the beginning so that work for the lower degree will constitute the initial stage of the doctoral discipline and, upon completion, will admit him to full status in the Graduate Council (see page 71).

FOREIGN LANGUAGE REQUIREMENT

Before being admitted to candidacy the student must show that he has a reading knowledge (certified by the appropriate foreign-language department) of at least one modern foreign (European) language, selected by the department or committee under which he is studying. A student whose field is a modern foreign language or literature may not offer that language in satisfaction of the reading-knowledge requirement. Any candidate who chooses to meet the language requirement in French, German, or Spanish and has not passed the language examination by the end of 15

attempted semester hours must register for French 49, German 49, or Spanish 49 as part of his next registration. The Master's reading examination is given at the first and last class meeting of each of these courses and on the last Saturday of the Summer Term. No student will be permitted to take the examination after three unsuccessful attempts. Those enrolled in French 49, German 49, or Spanish 49 who pass the first examination are excused from the course and will receive a refund of tuition. Students who expect to take a reading examination in any approved language other than French, Spanish, or German should notify the Dean at the time of registration.

Students are reminded of the necessity for early satisfaction of this requirement, normally not later than the end of the first semester of registration for the degree.

ADMISSION TO CANDIDACY

A student must be admitted to candidacy before he begins the last half of his work for the Master's degree, i.e., not later than the completion of 15 semester hours of degree courses. Application for admission to candidacy is made on a form obtained at the Office of the Dean, and must be approved by the appropriate representative of the department or committee and by the Dean. If a prospective candidate, in his previous academic work, has not substantially satisfied the prerequisites for the Master's degree, including the undergraduate major as defined by the appropriate department or committee, he will not be admitted to candidacy until such deficiency has been made up. He may make up his deficiencies by electing appropriate courses in addition to those counted toward his degree.

THE THESIS

The thesis may be of a research, expository, critical, or creative type. The main purpose of a Master's thesis is to demonstrate the student's ability to make independent use of the information and training acquired through his other disciplines, and to furnish objective evidence of his constructive powers in his chosen field. Registration for the thesis must be no later than the beginning of the final year of preparation, unless the professor in charge of the thesis permits registration at the beginning of the final semester. The choice of the thesis subject must be approved by the professor in charge of the student's field and recorded in the Office of the Registrar by the date announced in the University calendar. Registration for the thesis is ordinarily made on the basis of 3 hours for each of two successive semesters. In exceptional cases, and with the approval of the professor in charge of the thesis, the student may register for the entire 6 hours during a single semester. The thesis in its final form must be presented to the Dean, no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis (see pages 44-45) are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period the student must register for it again, and pay tuition on the same basis as for a repeated course.

THE MASTER'S EXAMINATION

In addition to such other examinations as may be required, the candidate must pass a general written examination on the major subject. Examinations are held on dates fixed by the department or committee, but in no case later than January 15 for the fall semester, May 15 for the spring semester, and August 7 for the summer session. The provisions of the field-of-study plan for undergraduate majors which concern the general examination for the major also apply to the Master's Examination. A candidate who fails to pass the Master's Examination may, in exceptional circumstances and with the specific approval of the Committee on Studies, repeat the examination, but only after the lapse of one semester. If he fails a second time, no further opportunity to take the examination will be permitted.

THE GRADUATE COUNCIL

A. E. Burns, *Dean and Chairman*

MEMBERS OF THE COUNCIL*

Professors P. W. Bowman, J. W. Brewer, H. F. Bright, A. E. Burns, R. D. Campbell, J. H. Coberly, R. H. Davison, Mitchell Dreese, D. C. Faith, Wood Gray, A. M. Griffin, I. B. Hansen, C. A. M. Hogben, Thelma Hunt, Herbert Jehle, F. E. Johnston, E. L. Kayser, J. W. Kendrick, R. D. Kennedy, W. H. Kraus, C. E. Leese, W. K. Legner, H. L. Ley, Jr., C. D. Linton, T. P. G. Liverman, H. G. Mandel, G. E. McSpadden, Florence Mears, H. M. Merriman†, C. R. Naeser, N. D. Nelson, C. E. Olmstead, M. I. Protzman, Mary Robbins, W. F. Sager, Wilson Schmidt‡, Lewis Slack, R. B. Stevens, I. R. Telford, C. R. Treadwell, F. S. Tupper, B. D. Van Evera, D. S. Watson, W. R. West, N. A. Wiegmann, R. E. Wood, S. N. Wrenn
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Assistant Professor Ruth McClintock

Consultants in Research S. J. Ajl, Antonio Alonso, R. A. Altenbern, Roscoe Brady, Jr., G. M. Briggs, B. B. Brodie, Arthur Brown, Dean Burk, J. J. Burns, W. R. Carroll, H. M. Cathey, C. L. Christ, J. F. Clark, R. W. Clarke, Gerhard Colm, Margaret deVries, W. R. Duryee, F. N. Frenkiel, Abraham Goldin, N. B. Gove, R. L. Grant, Edward Haskaylo, H. F. Haviland, Jr., Roy Hertz, Roger Hilsman, Leon Jacobs, L. C. Johnson, Solomon Kullback, B. N. La Du, Jr., H. M. Lenhoff, L. L. Marton, Margaret Mercer, Winfred Overholser, J. J. Polak, J. C. Reid, J. H. Roe, S. M. Rosenthal, L. P. Schultz, R. S. Sigafos, L. B. Smith, DeWitt Stetten, Jr., T. D. Stewart, M. J. Surgalla, Sidney Udenfriend, E. P. Vollmer, Ludwig von Sallmann, F. M. Weida, G. G. Wright, W. H. Wright, R. A. Young

* The President of the University, the Dean of Faculties, and the Registrar of the University are members of the Council.

† This listing of Members of the Council and Consultants in Research is for the academic year 1959-60.

‡ On sabbatical leave fall semester 1960-61.

§ On leave of absence fall semester 1960-61.

|| On sabbatical leave summer 1961.

On sabbatical leave spring semester 1960-61.

• On leave of absence 1960-61.

GENERAL INFORMATION

INTRODUCTORY

The Graduate Council offers a program of advanced study and research leading only to the degree of Doctor of Philosophy. It was established in 1930 to replace the Graduate School which had formerly administered work for the Master's as well as the Doctor's degrees. The Graduate Council provides a doctoral discipline which moves freely across administrative lines dividing departments of instruction or fields of study. It gives personal supervision to a limited number of students, each of whom has his own consultative committee, examinations, and research direction.

ADMISSION PROCEDURE

For admission to doctoral work the student must possess adequate preparation for advanced study, together with acceptable personal qualities and a capacity for creative scholarship. Adequate preparation presupposes a satisfactory Bachelor's degree in the same general field as that proposed for doctoral study. Students beginning the first year of graduate study who plan to work towards the degree of Doctor of Philosophy are given provisional status in the Graduate Council. However, if these students wish, and if the Dean of the Graduate Council so advises, they may register for the Master's degree in the liberal arts (Columbian) college or in the School of Government, Business, and International Affairs during the first year and apply for transfer to full status in the Council upon completion of the Master's degree work.

Application forms may be obtained from the Office of the Dean of the Graduate Council. The form must be filled out completely and returned with the application fee of \$10, together with a recent photograph, signed by the applicant. At the time of filing the application, the student should request that transcripts of all previous academic training be sent to the Office of the Dean, together with letters of recommendation. Each application, with transcripts and letters, is examined by a committee which, if the applicant is accepted, constitutes his Consultative Committee. This Committee supervises all aspects of the student's program and work, leading to the general examinations (Council Fellowship Examination).

THE PLAN OF WORK

The discipline for the degree is divided into three stages. (1) The first year of graduate study constitutes the initial stage, either in the Graduate Council on provisional status, or in Columbian College or the School of Government, Business, and International Affairs enrolled as a Master's candidate intending to gain full status in the Council.* (2) Full status in the Council follows completion of the first year of graduate study and culminates in the Council Fellowship Examination. (3) The final stage is given to research and investigation of a particular project in a special field, the presentation of the findings in a written dissertation, and the Final Examination.

LANGUAGE EXAMINATIONS

French and German are the normally required languages; reading proficiency must be demonstrated by examination. The examinations are arranged through the Office of the Dean. The satisfactory completion of French and/or German meets the language requirement. The Consultative Committee may allow either French or German to be replaced by another language important to the student's

* Students on a part-time basis will normally complete a year of graduate study in two years.

research interest. Language examinations may be taken soon after entrance, but the first one must be passed no later than the beginning of the second semester following admission. The second examination must be passed well before completion of work for the Council Fellowship Examination.

THE FIRST YEAR OF STUDY

A student who enters the Graduate Council on provisional status to undertake the first year of graduate study has his program planned by a Consultative Committee. If the first year of work is taken in Columbian College or the School of Government, Business, and International Affairs preparatory to gaining full status, Graduate Council advisers aid in planning the Master's program to fit the work into the doctoral program of the student. Upon satisfactory completion of the first year, the student is eligible to apply for full status. Students who have completed a year of satisfactory graduate work at other universities are eligible to apply directly for full status in the Graduate Council.

STUDY FOR THE COUNCIL FELLOWSHIP EXAMINATION

At the beginning of the student's full status, the Consultative Committee is assigned to direct his work in an integrated group of fields of learning, usually five or six in number, deemed necessary to insure his breadth of knowledge, as well as to support the dissertation project in his central field. Members of the Consultative Committee advise the student concerning the scope and content of these supporting fields, and assist him in preparation for his examination in them.

This advanced study in full status does not entail the taking of a second full year of graduate courses and seminars. Additional course work may not be necessary in some cases; in any event, the Consultative Committee determines whether such additional course work is needed, and if so, how much. In this stage of the work the main emphasis in preparation is on conferences with committee members and independent study. Performance in the Council Fellowship Examination is the test of the student's ability to enter upon the final stage of his doctoral discipline.

The examination is a series of written tests usually extending over a period of one week. The major portion of a day is given to each part of the examination covering one of the fields of study on the student's program. If the results of the examination are satisfactory the student is admitted as a Fellow of the Graduate Council, to pursue his specialized study and research under the supervision of a member of the Council.

RESEARCH, THE DISSERTATION, AND THE FINAL EXAMINATION

After the student has been admitted as a Fellow of the Council and his research program has been arranged, he is responsible to the member of the Council who directs his research project. As a Fellow, he may attend general meetings of the Council and participate in the programs of research discussion, and enjoy unrestricted use of all the academic facilities of the University. When necessary, the Graduate Council makes provision for sending the Fellow to some other institution, library, or laboratory for special study in connection with his doctoral investigation.

The doctoral dissertation is required of all Fellows as evidence of ability to perform scholarly research and to interpret its results. No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation together with a fourth copy of the summary. Printed copies of detailed regulations regarding the form and reproduction of the disserta-

tion and its summary (see pages 44-45), are available in the Office of the Dean. The summaries of accepted dissertations are printed in a numbered issue of the University BULLETIN. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

When the completed dissertation has been approved by the Master, and by two other members of the Council, and submitted to the Office of the Dean, the Fellow is presented for his final examination. This examination is oral and open to the public. The committee of examiners includes not only members of the Council competent in the research field or in closely related subjects, but also at least two qualified experts from other research institutions brought to the University to participate in the examination. If the Fellow satisfies the examining committee concerning the high quality and originality of his contribution to knowledge as well as his mastery of the scholarship and research techniques of his field, the Council recommends him for the degree of Doctor of Philosophy.

FIELDS OF RESEARCH

The following fields of research have been authorized by the Graduate Council as those in which doctoral investigations and dissertations may be undertaken. The supporting fields of study required of all candidates for the degree of Doctor of Philosophy are specified for each individual student by his Consultative Committee before admission to study under the Council.

This list of fields is subject to such changes as the educational resources of the University may direct. The prospective student may address preliminary inquiries concerning his research interests to the member of the Council who is in charge of the field, or to the Dean of the Graduate Council.

LITERATURES AND LANGUAGES

American

- (1) Fiction; (2) Social Themes in Literature; (3) Literary Nationalism

Coberly

English

- (1) Sixteenth Century Drama; (2) Seventeenth Century Drama
Seventeenth Century Literature
(1) Eighteenth Century Literature; (2) History of English Drama
Twentieth Century Literature

Tupper
Reesing
Highfill
Linton

Germanic

- (1) Middle High German Language and Literature; (2) Early New High German Language and Literature
(1) Old High German Language and Literature; (2) German Romanticism
Old Norse Language and Literature

Legner
King
Allee

Romance

- Modern Spanish Literature
(1) Linguistics; (2) Spanish American Literature; (3) Spanish Literature
Seventeenth Century Literature
French Literature since 1880
(1) Eighteenth Century French Literature; (2) Twentieth Century French Literature
(1) Nineteenth Century Spanish Literature; (2) Twentieth Century Spanish Literature
(1) Spanish American Literature; (2) Modern Spanish Literature

Alonso
McSpadden
Protzman
Clubb
Meade
Supervia
Robb

SOCIAL SCIENCES

Economics

History of Economic Thought
 Economic Policy
 Economic Theory
 International Economics
 International Finance
 Methodology of Economics
 National Income
 Public Finance
 Soviet Economics
 Transportation

Burns
 Watson
 Watson, Skinner
 Schmidt
 Polak, Young, de Vries
 Skinner
 Kendrick, Colm
 Colm
 Kennedy

Geography

Area Synthesis

Campbell

History

European: Diplomatic since 1815
 European: Nationalism
 European: Russian and Soviet
 History of Religion in the United States
 The Modern Near East
 Latin American
 United States: Diplomatic
 United States: (1) Social; (2) Economic
 United States: Political

Davison
 Kayser
 Thompson
 Olmstead
 Davison
 Davis
 Merriman
 Gray
 Haskett

International Relations

Program includes work in Economics, History, and Political Science

Political Science

Comparative Government and Political Theory
 International Politics and Organization
 International Law: (1) War and Neutrality; (2) Arbitration
 International Relations
 International Relations, especially American Foreign Policy
 (1) The Political Process; (2) Political Controls Over Administrative
 Agencies
 United States: (1) The Legislative Process; (2) Governmental Organization
 and Administration

Kraus
 Brewer
 Hilsman
 Haviland
 LeBlanc
 West

Psychology

Abnormal
 Comparative
 Counseling and Guidance
 Experimental
 Military Counseling and Guidance
 Personnel Psychology
 (1) Psychological Measurements; (2) Abnormal Psychology
 Social Psychology

Mercer
 Caldwell
 Dreese
 Walk
 Faith
 Mosel
 Hunt
 Tuthill

Chemistry

MATHEMATICAL AND PHYSICAL SCIENCES

Analytical
 Geochemistry
 Inorganic
 Organic
 Physical: Kinetics and Electrochemistry

Schmidt
 Naezer, Christ
 Naezer, Perros
 Wrenn
 Wood

Physical: Solubilities
Physical-Organic: Reaction Mechanisms

Van Evera
Sager

Mathematics

Algebra: Finite Groups
Algebra: Matrix Theory
Analysis: Functional Analysis
Analysis: Infinite Series
Mathematical Logic

Johnston
Wiegmann
Liverman
Mears
Nelson

Physics

Atmospheric Physics
Biophysics; Theoretical: (1) Quantum Mechanics; (2) Molecular Physics;
(3) Relativity
Electron Optics
(1) Experimental Nuclear Physics; (2) Radioactivity
Low Energy Nuclear Physics
Theoretical: Aerodynamics

Clark
Jehle
Marton
Slack
Gove
Frenkiel

Statistics

Multivariate Analysis
(1) Applied: Econometrics; (2) Theoretical: Probability and Sampling
(1) Psychometrics; (2) Managerial Statistics

Kullback
Weids
Bright

MEDICAL SCIENCES

Anatomy

Embryology
Gross Anatomy
Histology
Neuro-ophthalmology
Physical Anthropology

Allan
Telford
Telford, Johnson
von Sallmann
Stewart

Biochemistry

Amino Acid Metabolism
Animal Nutrition
Ascorbic Acid Metabolism
Biochemical Detoxication
(1) Carbohydrate Metabolism; (2) Nutrition (emphasis on vitamins);
(3) Pathological Chemistry
Carbohydrate Metabolism
Chemistry and Metabolism of Proteins
Complex Lipids
Lipids
Metabolic Relationships of Insulin
Protein Biosynthesis
Tissue Respiration

La Du, Udenfriend
Briggs
Burns
Brodie
Roe

Stetten
Carroll
Brady
Treadwell
Grant
Lenhoff
Burk

Microbiology

Bacterial Physiology and Nutrition
Determinative Bacteriology
Immunology
(1) Intestinal Microbiology; (2) Immunology: Antigenic Analysis
Microbiology
Virology

Ajl, Altenbern
Hugh
Surgalla, Wright
Griffin
Jacobs
Robbins, Ley, Brown

Pharmacology

Cancer Chemotherapy
Medicinal Chemistry
Drug Metabolism

Reid
Mandel
Goldin, Davison, Mandel

Physiology

- (1) Axonology; (2) Special Senses
 (1) Blood Pressure Studies; (2) Neuro-muscular Studies
 Cardiovascular Shock
 Cellular Physiology
 Endocrinology
 (1) Gastrointestinal Physiology; (2) Electrolyte Metabolism
 Hemodynamics
 Peripheral Circulation
 Renal Physiology

Diecke
 Leese
 Rosenthal
 Duryee
 Vollmer, Hertz
 Hogben
 Clarke
 Renkin
 McClintock

Psychiatry

- Problems of Treatment (M.D. degree required for admission)

Overholser

BIOLOGICAL SCIENCES**Biology****Cytology**

Bowman

Botany

- (1) Mycology; (2) Plant Pathology
 Taxonomy
 Plant Physiology: Vascular Plants
 (1) Mycology; (2) Plant Physiology; Micro-organisms
 Plant Ecology

Stevens
 Smith
 Cathey
 Hacskaylo
 Sigafoss

Zoology

- Entomology: Insect Physiology
 Parasitology: Parasitic Protozoa
 Vertebrate: Embryology and Morphogenesis
 Vertebrate: Ichthyology

Munson
 Wright
 Hansen
 Schultz

POST-DOCTORAL STUDY

The Council expects its graduates to continue their interests in advanced study and research, and to contribute to its program. All graduates are listed as Associate Fellows and, upon request, receive notices of all general meetings. They may continue any studies in the University without payment of tuition, and enjoy all University library privileges. Such graduates are required to pay only the usual residence fee in order to establish their active membership in the University. The use of laboratory space and equipment is contingent upon availability, and the cost of all laboratory or special library material is paid by the graduate. Special arrangements for such privileges must be made with the Dean of the Council. Post-doctoral work taken under this privilege may not be applied toward any degree offered by the University.

REGULATIONS

Candidates and Fellows in the Graduate Council are subject to, and are expected to familiarize themselves with, the regulations regarding REGISTRATION, FEES AND FINANCES stated on pages 9-23, and the University regulations stated on pages 40-46.

RESIDENCE AND CONTINUOUS REGISTRATION

The Graduate Council expects all students to work on their doctoral programs in residence, although there is no formal regulation concerning the minimum amount of time of resident study either in preparation for the Council Fellowship Examination or as a Fellow of the Council engaged in doctoral research. The student who

undertakes either part of the doctoral program on full or limited schedule must, in accordance with University regulations, maintain continuous registration under the Graduate Council even when the Council has granted a leave of absence for study or residence elsewhere. Failure to maintain registration in each semester of the academic year disrupts the residence status of the student (see pages 43-44). In such case, the student must reapply for admission to the Council, under whatever new conditions and regulations are set up by his Consultative Committee or the member of the Council who directs his research.

TEACHING FELLOWSHIPS AND GRADUATE ASSISTANTSHIPS

A limited number of teaching fellowships are assigned annually to certain departments of instruction open to doctoral students registered under the Graduate Council. In many departments of instruction graduate assistants are appointed to assist in the academic program. Applicants for teaching fellowships and graduate assistantships should inquire directly of the executive officer of the department concerned regarding vacancies, details of appointment, and the kind of personal data to be supplied for consideration.

UNITED STATES GOVERNMENT FELLOWSHIPS

The University is participating in the following Government Fellowship Programs: National Science Foundation Cooperative Graduate Fellowships and Summer Fellowships for Graduate Teaching Assistants, and the Fellowships created under the National Defense Education Act. Qualified students should write directly to the Dean of the Graduate Council for information and applications for these Fellowships.

A pamphlet describing details of the Graduate Council program, together with a current list of fields of research offered by the Council, will be sent upon request to the Office of the Graduate Council.

THE SCHOOL OF MEDICINE*

THE FACULTY†

John Parks, *Dean*; A. M. Griffin, *Associate Dean*; A. E. Parrish, *Associate Dean*

Professors H. F. Anderson, R. H. Barter, Brian Blades, T. M. Brown, Paul Calabrisi, C. S. Coakley, R. A. Cox, A. M. Griffin, C. A. M. Hogben, C. E. Leese, H. L. Ley, Jr., H. G. Mandel, John Parks, T. M. Peery, W. W. Stanbro, Harold Stevens, I. R. Telford, C. R. Treadwell, J. W. Watts, C. S. Wise, Leon Yochelson

Clinical Professors W. S. Anderson, L. R. Culbertson, H. L. Darner, C. R. L. Halley, W. S. McCune, E. A. W. Sheppard

Associate Professors F. N. Miller, Jr., A. E. Parrish

Associate Clinical Professors W. A. Howard, J. J. McFarland, Jr.

Assistant Clinical Professor J. L. Levine

Administrator of the University Hospital V. F. Ludewig

* Faculty and committee members listed here are for the academic year 1960-61.

† The President of the University, the Dean of Faculties of the University, and the Registrar of the University are members of the Faculty.

COMMITTEES*

THE DEAN'S COUNCIL

Brian Blades, T. M. Peery, I. R. Telford, J. W. Watts, V. F. Ludewig

COMMITTEE ON ADMISSIONS

Paul Calabrisi, *Chairman*

H. G. Mandel, Ruth McClintock, W. P. McKelway, F. N. Miller, Jr., J. E. Rankin

COMMITTEE ON CURRICULUM

T. M. Peery, *Chairman*

C. A. M. Hogben, M. J. Romansky, J. G. Sites, I. R. Telford, J. R. Thistlethwaite,
C. R. Treadwell

COMMITTEE ON SCHOLARSHIP

I. R. Telford, *Chairman*

Brian Blades, T. M. Brown, C. A. M. Hogben, T. M. Peery

COMMITTEE ON RESEARCH

C. R. Treadwell, *Chairman*

J. M. Evans, T. N. Johnson, H. L. Ley, Jr., H. C. Pierpont, Harold Stevens

COMMITTEE ON LIBRARY

C. E. Leese, *Chairman*

Seymour Alpert, S. W. Bush, H. G. Mandel, Mary Robbins

COMMITTEE ON GRADUATE AND POSTGRADUATE STUDY

T. M. Brown, *Chairman*

R. H. Barter, Brian Blades, C. S. Coakley, Leon Yochelson, V. F. Ludewig

COMMITTEE ON APPOINTMENTS AND PROMOTIONS

Brian Blades, *Chairman*

T. M. Peery, C. R. Treadwell

ADVISORY COMMITTEE ON CANCER RESEARCH

L. K. Alpert, *Chairman*

Frank Allan, J. M. Bailey, J. K. Cromer, C. T. Klopp, William Newman, Mary Robbins, W. W. Saunders

ADVISORY COMMITTEE ON REHABILITATION

C. S. Wise, *Chairman*

J. P. Adams, T. M. Brown, J. M. Evans, Irene Tamagna, J. R. Thistlethwaite

* The Dean of the School of Medicine and Associate Deans are members ex officio of all committees.

GENERAL INFORMATION

INTRODUCTION

The School of Medicine of The George Washington University was opened in March 1825. Of the medical schools now in existence in the United States, it is the eleventh in chronological order of founding. The University Hospital and Dispensary were established in 1898 as a part of the organization of the School. The present George Washington University Hospital was opened in 1948, and the Helen L. and Mary E. Warwick Memorial Building housing the Cancer Clinic was completed in 1954. Additional clinical facilities are used at the District of Columbia General Hospital, Children's Hospital, St. Elizabeths Hospital, and Mt. Alto Veterans Administration Hospital. The School of Medicine maintains close affiliation not only with the various divisions of the University, but also with the numerous medical research and scientific establishments of the federal government in the Nation's Capital. Washington provides world renowned library facilities, comprehensive museums, and excellent recreational facilities which are available to students.

OBJECTIVES

The purpose of the School of Medicine is to prepare men and women in the art and science of medicine to meet the health needs of a growing, ever changing society. It is the responsibility of the School of Medicine to provide its students with a systematic plan of instruction in the basic medical sciences, with well guided clinical experience, with opportunities for expression in research, and with a philosophy in keeping with the highest ethics of the profession.

To achieve these objectives the School of Medicine has developed a progressive plan of instruction and a balanced, comprehensive curriculum. To carry out the program the University maintains a faculty of adequate size and of outstanding ability and makes use of facilities which provide exceptional opportunities for research and clinical training.

PLAN OF INSTRUCTION

The curriculum is a progressive one, beginning with basic medical science and expanding to include the more complex aspects of the prevention of disease and care of the sick. The teaching program is organized under the various departments of the School of Medicine. (See "Courses of Instruction".)

The schedule for the first year begins with an orientation week designed to introduce the new students to the Faculty, to the upperclassmen, and to the environment for their medical education. The students meet for informal panel discussions with upperclassmen and members of the Faculty on such subjects as curriculum, medical terminology, use of library facilities, ethics and aims of the medical profession, and student health.

First year instruction is given in anatomy, biochemistry, and physiology using the classroom and laboratory facilities of the School of Medicine. Early in their medical careers students are encouraged to participate in research.

Having completed the preliminary study of structure and function of the normal body, the student progresses in the second year to a consideration of disease processes and mechanisms. The various microbial agents capable of causing disease are studied in the course in microbiology, and the effect of these and other harmful substances upon the body are studied in the course in pathology. The modes of action of various therapeutic agents are considered in the

course in pharmacology. Introductory lectures and demonstrations in the clinical sciences are given during the second semester in order to prepare the student for the responsibilities of the following year.

In the third year the student is assigned to the District of Columbia General Hospital for lectures, conferences, and clinical studies. He serves in the various divisions of the hospital assisting in the preparation of clinical records and performing certain clinical laboratory examinations. He learns to apply diagnostic and therapeutic procedures in the care of patients. During this period instruction is individual or in small groups. The instructor reviews the student's observations at the bedside and guides him in the development and application of his knowledge.

During the following summer each fourth year student is required to spend eight weeks in one of the clinical facilities of the School of Medicine. In the fourth year the student's responsibility for inpatient care continues and enlarges, but at least an equal part of his time is spent in the study and care of clinic patients. The University Hospital, the District of Columbia General Hospital, Children's Hospital, Mount Alto Veterans Administration Hospital, and St. Elizabeths Hospital provide the student with experience in many fields. In this final year of formal medical education stress is placed upon the total patient and his environment so that emotional and economic as well as physical factors may be considered in the restoration of the individual to a state of health and happiness.

Upon satisfactory completion of the four-year course of the School of Medicine, the student is well prepared for graduate training leading to a career in general or specialty practice, research, medical education, or government service.

THE CURRICULUM

FIRST YEAR

| Subject | Lecture | Laboratory or Clerkship | Conference | Total |
|--------------------------------------|---------|-------------------------------|------------|-------|
| Gross Anatomy | 85 | 210 | — | 295 |
| Embryology and Histology | 60 | 120 | — | 180 |
| Neuroanatomy | 32 | 56 | — | 88 |
| Biochemistry | 76 | 180 | 32 | 288 |
| Physiology | 112 | 152 | 32 | 296 |
| Biostatistics | 16 | — | — | 16 |
| Disaster Medicine | 16 | — | — | 16 |
| Introductory Medical Psychology..... | 16 | — | — | 16 |
| Psychopathology | 16 | — | — | 16 |
| Total | 429 | 718 | 64 | 1,211 |

SECOND YEAR

| Subject | Lecture | Laboratory or Clerkship | Conference | Total |
|--|---------|-------------------------------|------------|-------|
| Microbiology | 64 | 144 | 16 | 224 |
| Pathology | 64 | 136 | 32 | 232 |
| Pharmacology | 40 | 80 | 24 | 144 |
| Physical Diagnosis | 16 | 96 | — | 112 |
| Psychiatry | 32 | 48 | — | 80 |
| Clinical Microscopy | 16 | 32 | — | 48 |
| Medicine | 48 | — | — | 48 |
| Surgery | 32 | — | — | 32 |
| Community Health | 32 | — | — | 32 |
| Pediatrics | 32 | — | — | 32 |
| Neurology | 32 | — | — | 32 |
| Obstetrics and Gynecology | 16 | — | — | 16 |
| Radiology | 16 | — | — | 16 |
| Forensic Pathology and Medical Jurisprudence | 16 | — | — | 16 |
| Dermatology | 16 | — | — | 16 |
| Total | 472 | 536 | 72 | 1,080 |

THIRD YEAR

| Subject | Lecture, Conference or Clinic | Laboratory or Clerkship | Total |
|--|-------------------------------------|-------------------------------|-------|
| Anesthesiology | 16 | — | 16 |
| Clinical Pathological Conference | 16 | — | 16 |
| Medicine | 64 | 240 | 304 |
| Medical Laboratory | — | 60 | 60 |
| Neurology | 16 | 60 | 76 |
| Obstetrics and Gynecology | 96 | 120 | 216 |
| Ophthalmology | 16 | — | 16 |
| Pediatrics | 32 | 120 | 152 |
| Physical Medicine | 16 | — | 16 |
| Psychiatry | 16 | — | 16 |
| Radiology | 16 | — | 16 |
| Surgery | 112 | 240 | 352 |
| Otolaryngology | 16 | — | 16 |
| Admitting and Emergency | — | 120 | 120 |
| Therapeutic Conference | 32 | — | 32 |
| Urology | 16 | — | 16 |
| Total | 480 | 960 | 1,440 |

SUMMER CLERKSHIP

Medicine, Surgery, Obstetrics and Gynecology or Pediatrics—eight weeks between third and fourth years.

FOURTH YEAR

| Subject | Lecture, Conference or Clinic | Laboratory or Clerkship | Total |
|---------------------------------------|-------------------------------------|-------------------------------|-------|
| Cancer Clinics | — | 120 | 120 |
| Clinical Pathological Conference | 28 | — | 28 |
| Forensic Medicine | 12 | — | 12 |
| Medicine | — | 360 | 360 |
| Obstetrics and Gynecology | — | 240 | 240 |
| Pediatrics | 28 | 240 | 268 |
| Psychiatry | — | 120 | 120 |
| Public Health Practice | 5 | — | 5 |
| Surgery | — | 360 | 360 |
| Surgical Anatomy | 15 | — | 15 |
| Surgical Pathology | 12 | — | 12 |
| Total | 100 | 1,440 | 1,540 |

EQUIPMENT AND FACILITIES

Medical School Building.—The building housing the School of Medicine is a five-story structure with lecture rooms, classrooms, students' rooms, and the following laboratories: anatomy; biochemistry; microbiology and community health; pathology; pharmacology; and physiology.

They are fully equipped to enable students to pursue adequately the laboratory courses and to acquire the technical skill necessary in modern clinical and investigative work.

Research and Administration Building.—The Research Building houses special laboratories for graduate and staff research in the departments of Anatomy; Biochemistry; Microbiology and Community Health; Pharmacology; and Physiology. Special facilities are provided for the study of radioactive compounds, for tissue-culture techniques, and the virologic procedures. Selected students are invited to participate in certain aspects of the research program either on a volunteer basis or with the support of special Research Scholarships.

On the first floor, the west wing is occupied by a modern medical library; the east wing houses the administrative offices of the School of Medicine. Photographic laboratories and other facilities for audiovisual aids to education are on the second floor.

Medical Library.—The Medical Library in well-equipped quarters on the first floor of 1339 H Street, NW., contains 23,000 carefully selected volumes, including the new medical works and the principal medical journals.

Interlibrary loan service is maintained with other medical and scientific libraries.

The Medical Library is open from 9:00 A.M. to 10:00 P.M. each class day, Monday through Friday, and from 9:00 A.M. to 5:00 P.M. Saturday.

A branch of the Medical Library is maintained in the University Hospital for the use of the resident physicians, interns, and students. It is open Monday through Friday, 1:00 to 5:00 P.M. and 6:00 to 11:00 P.M. During the academic year the library is also open Saturday and Sunday from 1:00 to 5:00 P.M.

The George Washington University Hospital.—This 425-bed hospital is staffed and directed by the Faculty of The George Washington University School of Medicine. It provides excellent clinical opportunity for the instruction of medical students. Practically every specialty in the fields of medicine and surgery has assigned space and equipment in both the outpatient department and the bed-patient section of this modern hospital.

GOVERNMENT MUSEUMS

The Armed Forces Institute of Pathology, on the grounds of Walter Reed Army Medical Center, affords unexcelled opportunity for study of conditions met in general medicine and surgery as well as those of special military significance. Its collection of anatomical and pathological specimens comprises material received from all areas of the world and is unequaled in this country. The Museum of Hygiene, the National Museum, the Smithsonian Institution, the Botanic Gardens, and the various collections of the Department of Agriculture all afford opportunity for study of materials of special interest in various areas of Medicine and its allied sciences.

CLINICAL FACILITIES

Students at The George Washington University School of Medicine receive clinical training at the University Hospital, at the University Cancer Clinic, and at four affiliated hospitals.

The George Washington University Hospital.—The Medical Director and Chiefs of Services are responsible for the supervision of patient care. The individual student has direct responsibility to patients under supervision. Clinical and clinical pathological conferences are held in which the history of patients, the physical findings, laboratory records, and the post-mortem pathology, are presented and correlated.

The University Clinics.—The University Clinics have facilities for each Service in the Hospital. Fourth-year students are assigned in rotation by section for instruction in the University Clinics.

The George Washington University Cancer Clinic.—The Helen L. and Mary E. Warwick Memorial building, opened in 1954, houses the Cancer Detection Clinic and special laboratories for research related to the nature, diagnosis, and treatment of cancer.

The facilities of the Cancer Detection Clinic are used for teaching medical students. The diagnosis and treatment of various forms of neoplasms are presented. The results of treatment are evaluated by follow-up studies.

District of Columbia General Hospital.—Washington's large city hospital has an annual census of 24,178 inpatients and 211,835 outpatients. It provides clinical opportunities in every branch of medicine and surgery.

Children's Hospital.—This is one of the largest and best known hospitals for children in the United States. Medical students receive training and clinical experience in pediatrics on both clinic and inpatient services.

St. Elizabeths Hospital.—This hospital provides care for approximately 8,000 patients a year with nearly every known psychiatric and neurologic disorder. The George Washington University medical students begin their studies in psychiatry

in their first year and these studies continue throughout the four years. Prominent psychiatrists and neurologists on the St. Elizabeths staff are members of The George Washington School of Medicine faculty.

Additional clinical experience in psychiatry is gained by students at The George Washington University Hospital and in the University Clinics. Special lectures and clinical work in child psychiatry are given in Children's Hospital.

Mt. Alto Veterans Administration Hospital.—Clinical experience in both medicine and surgery is provided at this Veterans Administration hospital.

ADMISSION, REGISTRATION, FEES AND FINANCIAL REGULATIONS

Students in the School of Medicine are subject to, and are expected to familiarize themselves with, the regulations stated on pages 9-23.

Registration in the School of Medicine is for the full academic year. After the student has entered the courses of instruction he is obligated for the full tuition. Acceptance by the School of a student's fee does not in any way obligate the School to accept the student for any subsequent year, and the right is reserved to require the withdrawal of any student from the School whenever, in the interest of the student or the School, the Faculty deems it advisable to do so.

A fee of \$10 to defray the costs of completing the records for final consideration by the Committee on Admissions must accompany each application. This fee applies to students whose premedical training was completed at this University as well as to students who have not previously attended this University. Fees for each semester are payable in advance.

The Committee on Admissions is guided in the selection of students by the applicant's academic ability, the results of the Medical College Admission Test, and personal qualifications as determined by letters of reference and personal interview. Applicants are interviewed on invitation by the Committee.

Each applicant is notified of the Committee's decision as soon as possible.

An applicant who is offered a place in a class is required, within two weeks, to notify the Director of Admissions of his intent to accept the place reserved for him. A deposit of \$100 must be remitted not later than January 15th prior to the opening of classes of the academic year for which he applied. This deposit will not be refunded after January 15th. It will be credited toward the tuition for the first semester.

Accompanying the offer of a place in class will be forms for a report on physical condition. This report must be completed and returned to the Director of Admissions by the applicant's physician within two months of receipt of the letter of acceptance.

Credit for work will not be given until, at the completion of a laboratory course, the student has replaced or paid for all articles of equipment or other University property which he has lost, broken, or destroyed. All breakage or loss not directly traceable to an individual student is assessed pro rata.

COST OF TEXTBOOKS AND STUDENT EQUIPMENT

The minimum cost of necessary textbooks and student equipment (microscope, drawing materials, glass slides, clinical thermometer, stethoscope, hemocytometer, uniforms, etc.) is approximately as follows: first year, \$500; second year, \$250; third year, \$125; fourth year, \$80; total \$955.

A fee of \$1 a semester is charged for the use (optional) of a locker.

REGULATIONS

Students in the School of Medicine are subject to, and are expected to familiarize themselves with, the general University regulations stated on pages 40-46.

ATTENDANCE

A student is not permitted to attend classes until registration has been completed and fees due have been paid. Regular attendance is required.

GRADES

The following grading system is used *A* (90-100); *B* (80-89); *C* (75-79); *D* (65-74) condition; *F* (below 65) failure; *I* (incomplete), the passing grade in each subject is *C* or above.

A student conditioned in any subject will not be advanced until such condition is removed and then only by authority of the Faculty.

EXAMINATIONS

Examinations, which may be written, oral, or practical, will be held during and at the end of each semester.

All students in the School of Medicine are required to take Part I and Part II of the National Board Examinations.

PHYSICAL EXAMINATIONS

All first-year students are required to have a comprehensive physical examination within 10 days of admission to the School of Medicine. The students are informed of significant findings and advised regarding such measures as will tend to help them maintain a high standard of health.

In addition medical students benefit from the complete Tuberculosis Case Finding Program which the School maintains. Under this program all students receive tuberculin tests, X-ray examinations, and such special attention from chest specialists as is necessary to reduce to a minimum the dangers from tuberculosis. Students are immunized against those diseases for which proven prophylaxis exists.

THE DEGREE OF DOCTOR OF MEDICINE

Upon the satisfactory completion of the requirements of the School of Medicine, the degree of Doctor of Medicine is conferred.

COMBINED ARTS AND MEDICINE CURRICULUM

In order to be recommended for the degree of Bachelor of Arts, the candidate must complete, at least 90 semester hours of prescribed college work (at least 30 hours and one year of residence must be completed in Columbian College, the senior liberal arts college), and the first year of the medical curriculum. Upon satisfactory completion of the fourth year of the medical curriculum the student becomes eligible for the degree of Doctor of Medicine.

REQUIREMENTS FOR THE DEGREE

Every candidate for graduation with the degree of Doctor of Medicine must be at least twenty-one years of age, and free of all indebtedness to the University. He must have completed satisfactorily not less than four academic years of study

as a matriculated student in Medicine, completed all required courses, and passed satisfactorily all prescribed examinations.

HONORS

A candidate who has completed the four-year medical course with an average grade of 90 or above, may be recommended by the Faculty for graduation "with distinction."

INTERN AND RESIDENT TRAINING PROGRAMS

The University Hospital offers mixed-type internships as classified by the National Intern Matching Program, Inc. Twenty-seven internships of one year each are offered: fourteen in the Department of Medicine, eleven in the Department of Surgery, and two in the Department of Pathology.

Mixed Internships, Medicine Major.—Interns are assigned to six months of general medicine, two months on the surgical service, and one month each on neuro-psychiatry, pediatrics, obstetrics and gynecology and the emergency room. One month of the training in medicine and one month in pediatrics are at the District of Columbia General Hospital.

Mixed Internships, Surgery Major.—Interns are assigned to the surgical services for nine months, to general medicine for two months, and to obstetrics for one month.

Mixed Internships, Pathology Major.—Interns are assigned to the pathology service for six months, to general medicine for two months, to surgery for two months, to pediatrics for one month, and to obstetrics for one month.

Fifty-five approved residencies are offered in anesthesiology, cardiac diseases, internal medicine, neurologic surgery, neurology, obstetrics-gynecology, pathology, pediatrics, physical medicine, plastic surgery, psychiatry, roentgenology, surgery, and thoracic surgery. Residency programs are from one to four years in duration, depending upon the service. Residents in the University Hospital also receive appointments as members of the Faculty of the School of Medicine with active teaching responsibilities.

Fellowships of one or two years are available in anesthesiology, cardiology, chest diseases, infectious diseases, outpatient service, physical medicine, rheumatic diseases, surgery, and thoracic surgery.

All appointments are for one year with the privilege of applying for continuation on the House Staff. In several of the intern, residency, and fellowship programs, excellent affiliations are maintained with local and governmental hospitals. Inquiries and applications for membership on the House Staff should be addressed to the Chief of the Department concerned or to the Medical Director of The George Washington University Hospital, 901 23d Street NW., Washington 7, D. C.

MEDICAL TECHNOLOGY COURSE

This course is open to candidates for the degree of Bachelor of Science in Medical Technology, offered by Columbian College, and to other applicants meeting the requirements of the Registry of Medical Technologists of the American Society of Clinical Pathologists. These requirements, fully satisfied by the Columbian College program, are as follows: two years (60 semester hours or 90 quarter hours) of college work in any college or university accredited by a recognized

bar; (4) institutes and forums on current topics in domestic and foreign law; (5) the publication of a law journal containing the results of research in public law; and (6) the encouragement of student professional co-curricular activities.

PROGRAMS OF STUDY

Traditionally the Law School has been national in the geographic distribution of its students. At the present time, men and women holding baccalaureate degrees from more than three hundred colleges and universities come from the fifty states and several foreign countries to comprise the student body. As a consequence the program of study leading to the degree of Bachelor of Laws has been planned to provide instruction and training for the practice of law wherever the Anglo-American legal system obtains.

Graduate work leading to the degrees of Master of Laws and Doctor of Juridical Science is offered for those desiring further study and research in specialized fields of law.

Provision is made for advanced study by members of the bar who do not desire to register as candidates for degrees. Lawyers may take courses for this purpose either as unclassified graduate students or as continuing legal education students.

Graduate work is offered also to meet the needs of lawyers who come from countries whose legal systems are not based on the English law. There are two programs of study, one leading to the degree of Master of Comparative Law for lawyers planning to return to their own countries, and the other leading to the degree of Master of Comparative Law (American Practice) for lawyers planning to remain in this country for the practice of law.

ENTERING CLASSES

The curriculum is organized so that students may enter the Law School at the beginning of the fall or spring semester of the academic year, but not at the beginning of the summer term.

MORNING AND EVENING DIVISIONS

Most morning classes meet for fifty-minute periods between 9:10 A.M. and 1:00 P.M., Monday through Friday; one class and Trial Practice Court meet for two-hour periods on Saturday morning.

Evening classes meet for two fifty-minute periods from 5:50 to 7:40 P.M., Monday through Friday. A four-credit course, e.g., Torts, meets two evenings a week; a two-credit course, e.g., Personal Property, meets one evening a week. The evening division conforms to the standards of the morning division, the full-time faculty participating in the instruction.

THE LIBRARY

The Law Library of 56,400 volumes contains the official reports of the decisions of the courts of last resort of all states prior to the National Reporter System, and of some states complete to date; the National Reporter System, complete; the reports of the United States Supreme Court and lower federal courts, and the reports of federal administrative agencies; Shepard's Citations for the units of the Reporter System; the English Reports, Full Reprint; the English Law Reports; the Times Law Reports; the Dominion Law Reports; the United States statutes and codes; complete sets of statutes of all the states; the English statutes; the principal English and American digests and encyclopedias; collections of special reports and annotated

cases; United Nations documents; and leading textbooks and treatises. Approximately 325 legal periodicals are currently received. A section of the library, consisting of books acquired from National University, is known as the National University Law Collection.

Also available to law students are 50,000 bound volumes and 20,000 pamphlets of the former library of the Carnegie Endowment for International Peace, in the fields of international law and relations, history, and economics, in the University Library.

The Law Library, which is on the fourth floor of Stockton Hall, is open from 9:00 A.M. to 10:00 P.M., Monday through Friday; from 9:00 A.M. to 5:00 P.M. on Saturday; and from 2:00 to 6:00 P.M. on Sunday. Books and other materials do not circulate and must be used in the library.

THE LAW REVIEW

The George Washington Law Review, published by the University, is edited and managed by students of the Law School under the supervision of faculty advisers. It is devoted exclusively to state and federal public law. The location of the University in the National Capital, where the primary sources of federal public law may be observed in operation, affords an unexcelled opportunity for specialization in this field.

The *Review* organization includes a faculty editor-in-chief, an associate faculty editor, a faculty board of advisory editors, a board of departmental advisory editors, and a board of student editors. The student editors are chosen each year on the basis of scholarship from full-time and part-time students.

THE STUDENT BAR ASSOCIATION

Every student in the Law School is a member of the Student Bar Association, which is organized to enable students to become better acquainted with problems of the profession, to foster professional ideals, and to bring about closer contact with members of the profession engaged in active practice of the law. The work of the Student Bar Association is carried on by various committees and by group and general meetings of a professional and social nature. From time to time lectures are given by outstanding authorities on legal and professional problems.

An important activity is the Van Vleck Case Club Competition, which provides an opportunity for training in appellate advocacy. First and second year students participate as contestants before courts composed of members of the Faculty and the local bar. Senior law students of the Case Club also sit as judges. The final argument is held before a court composed of distinguished federal judges.

The Legal Aid Program is under the joint sponsorship of The George Washington University Student Bar Association and the Junior Bar Section of the District of Columbia Bar Association. Participating students assist court-appointed attorneys in the preparation of cases for trial or appeal. Qualified second- and third-year students are eligible for participation in the program.

In the ranking of member associations by the American Law Student Association, The George Washington University Student Bar Association has received first place twice and second place twice in the past six years.

ORDER OF THE COIF

The Order of the Coif, a national honor society with chapters in over forty law schools, aims "to foster a spirit of careful study and to mark in a fitting manner

those who have attained a high grade of scholarship." The George Washington University Chapter was established in 1926. Members are elected each year from the highest-ranking 10 per cent of the graduating class of the Law School.

REGULATIONS

Students in the Law School are subject to, and are expected to familiarize themselves with, the following regulations and the regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 9-23, and the University regulations stated on pages 40-46.

AMOUNT OF WORK

Students without substantial outside employment may take a program of studies of 14 hours a week. Such students may take courses in the evening only if they are not available in the morning and if a majority of the hours taken are in morning courses. Students with substantial outside employment whether in the morning or evening division, must take a limited program of studies not exceeding 10 hours a week. Students taking a majority of their classes in the evening may not take more than 10 hours a week. A minimum schedule of 10 hours in the morning division and 6 hours in the evening division is required except in exceptional circumstances when a reduced program is authorized by the Dean for continuing students.

ATTENDANCE

Regular attendance at classes is required and is necessary for successful work. A student who is deficient in class attendance in any course may be barred from taking the examination.

RESIDENCE REQUIREMENTS

Candidates for the degree of Bachelor of Laws must complete a residence period of three academic years. Attendance in the morning division for the fall and spring semesters constitutes residence for an academic year; similar attendance in the evening division constitutes residence for three-fourths of an academic year. Consequently, a morning student must attend 6 semesters to meet residence requirements; an evening student must attend 8. Students authorized to take schedules of less than 10 hours in the morning division or less than 6 hours in the evening division receive residence credit on a proportional basis. Students who attend the summer sessions receive fractional residence credit.

Students planning to attend summer school sessions at other law schools and desiring to use credits obtained at such schools in their course at this Law School must first have the courses they wish to take approved by the Dean. In no event will credits be recognized in excess of those which might be obtained in a similar period in this School.

EXAMINATIONS

Written examinations are held at the end of each course. Every student is required to take the regular examinations unless excused. No excuse for absence will be granted except by the Dean and then only for illness or other emergency. Application for excuse must be made in writing not later than one month after the date of the examination. An entry of *I*, incomplete, will be made on the record of a student thus excused. To receive credit for the course, he must take the next regularly scheduled examination.

Permission to take an examination before the regularly scheduled date will not be

granted. Permission to take a postponed examination is limited to the situation provided for in the preceding paragraph.

A special examination will be granted only to a student entitled to take a postponed examination, who is a candidate for a degree to be conferred at a convocation which precedes the next regular examination in the subject. Written application, showing sufficient cause, should be addressed to the Dean, and approval will be granted at the discretion of the Faculty.

If a student fails to take an examination, a grade of *F* (to be counted as zero) will be recorded unless he has been excused from the examination as provided above or has obtained the Dean's permission to drop the course.

GRADES

Grades are indicated by the letters *A*, excellent, 85-100; *B*, good, 75-84; *C*, satisfactory, 65-74; *D*, poor, 55-64—below standard for graduation; *F*, failed—below 55; *I*, incomplete—student excused from failure to take regularly scheduled examination; and *EA*, excessive absences. See "Examinations" above, for grade upon failure to take an examination. The grades *A*, *B*, *C*, and *D* mean that the work has been completed and credit given for the courses. *D* grades, however, do not represent satisfactory work and adversely affect a student's cumulative average. *F*, failed, means that no credit will be given.

A student may not repeat a course he has failed except by permission of the Faculty.

The cumulative average of a student includes all the grades in all the courses taken while he is in the Law School as a candidate for a particular degree. When a course is repeated, both the first grade and the subsequent grade or grades are counted in the cumulative average.

EXCLUSION AND PROBATION FOR POOR SCHOLARSHIP

Candidates for the Degrees of Bachelor of Laws and Juris Doctor.—A student will be excluded who fails in courses aggregating 8 or more semester hours in one semester or in two successive semesters, or who fails in courses aggregating 10 or more semester hours during his period of law study. A student subject to exclusion under this provision who is currently registered will be permitted to complete the work of the semester.

A student not subject to exclusion under the foregoing rule who at any time fails to maintain a cumulative average of at least *C* will be placed on probation. A student on probation may at the discretion of the Dean be required to reduce his program of study. If a student on probation does not, by the end of the second semester following that in which his average has fallen below *C*, receive grades sufficient to give him a cumulative average of at least *C*, he will be excluded. If a student on probation attains a cumulative average of at least *C* by the grades received during the semester his status will then become clear. A maximum of three semesters of probation is allowed. Thus, if a student whose status has become clear after two semesters of probation subsequently goes on probation, he will be allowed only one semester of probation in which to raise his average to at least *C*.

In special cases in which a student who has been excluded can clearly demonstrate that his low grades were due to special circumstances beyond his control and that he has the capacity to pursue the study of law with a definite likelihood of success, such student may be readmitted by the Faculty subject to such conditions as the Faculty may impose.

Candidates for Graduate Degrees.—A candidate for one of the graduate degrees whose work is not satisfactory in the opinion of the Faculty, taking into consideration the requirements and standards for the degree, may, by action of the Faculty, be excluded at the end of the semester for which he is currently registered.

Unclassified Students.—An unclassified student whose work is not satisfactory in the opinion of the Faculty may, by action of the Faculty, be excluded at the end of the semester for which he is currently registered.

CLASSIFICATION OF STUDENTS

Candidates for the degree of Bachelor of Laws are divided into classes on the completion of semester hours as follows: (1) full-time students: first year, 1-28; second year, 29-56; third year, 57 or more; (2) part-time students: first year, 1-20; second year, 21-40; third year, 41-60; fourth year, 61 or more.

THE DEGREES OF BACHELOR OF LAWS AND JURIS DOCTOR

The programs of study leading to the degrees of Bachelor of Laws and Juris Doctor are addressed to the development and application of legal principles, skills, and ideals which are indispensable to the equipment of a lawyer for professional responsibility and leadership in modern society. They include, first and foremost, the traditional core of legal education, namely, the study of legal materials—judicial, statutory, and administrative—and instruction in the understanding and technique of their use. These programs include the study of the nature and purpose of law, the history of the Anglo-American legal system, and the history and standards of the legal profession; practice in the skills of legal research and legal writing; elementary training in trial practice; and, through the medium of seminars, experience in group handling of legal problems.

REQUIREMENTS FOR THE DEGREES

BACHELOR OF LAWS

To be recommended for the degree of Bachelor of Laws (LL.B.) the student must have completed a residence period of not less than three academic years (four years for evening students) and 80 semester hours, with a cumulative average of at least C. At least one academic year of residence and 28 semester hours are required of students admitted with advanced standing. Credits allowed by way of advanced standing are not included in computing the average required for graduation.

JURIS DOCTOR*

The degree of Juris Doctor (J.D.) is conferred as a recognition of the completion at The George Washington University Law School, with high rank, of the required program of study for the Bachelor's degree, including experience in research and legal authorship. To be recommended for this degree the student must have completed: (1) a residence period of not less than three academic years (four years for evening students); (2) 80 semester hours with a cumulative average of at least B including one of the following courses: Comparative Law I, Jurisprudence, or one of the graduate seminars; and (3) one year of acceptable service on the board of student editors of *The George Washington Law Review*, election to which is subject to

* The degree of Juris Doctor will be discontinued effective with respect to students entering the Law School in the 1961-62 academic year.

regulations laid down by the Faculty. All requirements for the degree must be completed at this Law School.

HONORS

The degree of Bachelor of Laws or of Juris Doctor "with distinction" will be awarded students who obtain a cumulative average of *A*.

CURRICULUM

Required and Elective Courses.—A program of required and elective courses has been developed to assure coverage of the basic courses and allow a degree of flexibility to meet the diverse interests of students. All first-year courses, four second-year courses, and one third-year course are required, leaving a total of 34 hours of electives. In general, second-year students are restricted to second-year electives but in appropriate cases the taking of third-year electives will be approved. Similarly, specially qualified third-year students may secure approval to take graduate courses and research in public law. It is important that students plan ahead regarding their electives.

Practice and Trial Practice Court.—Classroom instruction is conducted in pleading and procedure, trial and appellate practice, and evidence. This instruction includes grounding in the principles of the Federal Rules of Civil Procedure and the Federal Rules of Criminal Procedure. In addition, each senior student is required to participate in the work of the Trial Practice Court, which includes the trying of cases as junior counsel and as senior counsel. A special section of the court is devoted exclusively to the trial of patent cases. Experience in preparing and arguing appellate court cases is available through the Case Club Competition.

Patent Law.—Students interested in patent law should take the following group of courses: Unfair Trade Practices, Patent Law, Patent Office Practice, Patent Trial Practice Court, and Federal Antitrust Laws. Additional courses recommended are Advanced Topics in Patent Law and Trade Regulation Seminar.

Curriculum.—Following is the curriculum for students beginning in the fall semester. Adjustments are made to meet the needs of students beginning in the spring semester.

Morning Division

FIRST YEAR

| FALL SEMESTER | | SPRING SEMESTER | |
|-------------------------------------|----------------|----------------------------------|----------------|
| | Semester Hours | | Semester Hours |
| Contracts I | 4 | Constitutional Law | 4 |
| Legal Method and Legal System | 4 | Contracts II | 2 |
| Personal Property | 2 | Criminal Law and Procedure | 4 |
| Torts | 4 | Real Property | 4 |
| Total | 14 | Total | 14 |

SECOND YEAR

| FALL SEMESTER | | SPRING SEMESTER | |
|-----------------------|----------------|--------------------------|----------------|
| | Semester Hours | | Semester Hours |
| Civil Procedure | 4 | Administrative Law | 4 |
| Conveyances | 2 | Evidence | 4 |
| Electives | 8 | Electives | 6 |
| Total | 14 | Total | 14 |

THIRD YEAR

| FALL SEMESTER | | Semester Hours | SPRING SEMESTER | | Semester Hours |
|----------------------------|--|-------------------|----------------------------|--|-------------------|
| Trial Practice Court | | 2 | Trial Practice Court | | 2 |
| Electives | | 10 | Electives | | 10 |
| Total | | 12 | Total | | 12 |

Evening Division

FIRST YEAR

| FALL SEMESTER | | Semester Hours | SPRING SEMESTER | | Semester Hours |
|-------------------------------------|--|-------------------|----------------------------------|--|-------------------|
| Contracts I | | 4 | Contracts II | | 2 |
| Legal Method and Legal System | | 4 | Criminal Law and Procedure | | 4 |
| Personal Property | | 2 | Torts | | 4 |
| Total | | 10 | Total | | 10 |

SECOND YEAR

| FALL SEMESTER | | Semester Hours | SPRING SEMESTER | | Semester Hours |
|-----------------------|--|-------------------|--------------------------|--|-------------------|
| Civil Procedure | | 4 | Constitutional Law | | 4 |
| Real Property | | 4 | Conveyances | | 2 |
| Electives | | 2 | Electives | | 4 |
| Total | | 10 | Total | | 10 |

THIRD YEAR

| FALL SEMESTER | | Semester Hours | SPRING SEMESTER | | Semester Hours |
|--------------------------|--|-------------------|-----------------|--|-------------------|
| Administrative Law | | 4 | Evidence | | 4 |
| Electives | | 6 | Electives | | 6 |
| Total | | 10 | Total | | 10 |

FOURTH YEAR

| FALL SEMESTER | | Semester Hours | SPRING SEMESTER | | Semester Hours |
|----------------------------|--|-------------------|----------------------------|--|-------------------|
| Trial Practice Court | | 2 | Trial Practice Court | | 2 |
| Electives | | 8 | Electives | | 8 |
| Total | | 10 | Total | | 10 |

GRADUATE PROGRAM

DEGREES OF MASTER OF LAWS AND DOCTOR OF JURIDICAL SCIENCE

The administration of justice under law is a matter so vast and complex that some graduates feel the need for further study to broaden and deepen their understanding of the law. Others wish to extend their study into rapidly developing specialized fields. Graduate instruction, leading to the degree of Master of Laws enables qualified students to attain one or both of these objectives.

The degree of Doctor of Juridical Science is offered for selected students whose aim is to extend still further their studies by pursuing original research in law.

Graduate work is available to evening as well as morning students for the convenience of lawyers in private practice and in government service.

PROGRAMS OF STUDY FOR FOREIGN LAWYERS

Two programs of study are provided for lawyers who come from countries whose legal systems are not based on the English law. The degree of Master of Comparative Law is planned for those who wish to understand our system so that they may work intelligently with its materials and practitioners after returning to their own countries. The degree of Master of Comparative Law (American Practice), with an appropriate and more intensive program of study, is offered for foreign lawyers who wish to practice in a common law jurisdiction. Comparative Law students are not assigned to special classes but work in association with the students in the regular courses. Each student's program is adapted to his individual needs.

NONDEGREE STUDY: CONTINUING LEGAL EDUCATION

An important part of the graduate program is the offering of courses in various fields of the law for members of the bar not interested in degree candidacy but desirous of keeping abreast of current developments. The offerings in the field of governmental regulation provide opportunities for specialization. Although third-year and graduate courses are particularly suitable, first-year and second-year courses may be taken in appropriate cases. Members of the bar taking graduate work in this way register as unclassified students or as Continuing Legal Education students.

RESEARCH IN PUBLIC LAW

Research in public law is conducted under the supervision of members of the Faculty. The purpose of this research is to furnish means for training specialists in public law, either as government lawyers or as lawyers representing individuals or corporations in cases in which the Government is a party; and to assist in the analysis, clarification, formulation, and improvement of public law, substantive and procedural.

Candidates for the graduate degrees in the Law School and specially qualified seniors may pursue this work.

REQUIREMENTS FOR THE DEGREES

MASTER OF LAWS

To be recommended for the degree of Master of Laws (LL.M.) the student must have completed a residence period of not less than two semesters. Such residence should normally be continuous. All requirements for the degree must be completed in this Law School and in a period not exceeding two years after registration for work for the degree. The student must have completed, with a minimum average of B, 20 semester hours in courses listed in the law curriculum as graduate courses except that in appropriate cases second- and third-year courses may be approved for inclusion in the program of study if not previously taken.

MASTER OF COMPARATIVE LAW

The degree of Master of Comparative Law (M.Comp.L.) is for foreign students who intend to return to their countries. To be recommended for this degree the student must have completed a residence period of not less than one academic year. He must have completed satisfactorily 24 semester hours in approved courses in the curriculum of the Law School or of such other departments of the University as the Faculty of the Law School shall approve.

MASTER OF COMPARATIVE LAW (AMERICAN PRACTICE)

The degree of Master of Comparative Law, American Practice (M.Comp.L.(Am. Prac.)) is for foreign students who intend to remain in this country. To be recommended for this degree the student must have completed a residence period of not less than one academic year. He must have completed 28 semester hours in approved courses in the curriculum of the Law School with a cumulative average of at least C.

DOCTOR OF JURIDICAL SCIENCE

To be recommended for the degree of Doctor of Juridical Science (S.J.D.) the student must have completed a residence period of not less than one academic year. He must have pursued a course of study and research designated by his consultative committee and approved by the Committee on Graduate Studies. At the conclusion of his first year of residence, or at such other time as the Committee on Graduate Studies may set, the candidate must pass an oral examination in those fields of study selected by the consultative committee. This examination is conducted by the consultative committee and such other members of the Faculty and qualified experts as are selected by the Committee on Graduate Studies.

No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation together with a fourth copy of the summary. It is the responsibility of the candidate for a Doctoral degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the dissertation, which are rigidly enforced. To be acceptable the dissertation must, in the opinion of the examining committee, constitute a substantial contribution to the field of law concerned and be suitable for publication. Additional information will be supplied by the Chairman of the Committee on Graduate Studies.

The summaries of accepted dissertations will be printed in a numbered issue of the University BULLETIN. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

THE SCHOOL OF ENGINEERING

THE FACULTY AND STAFF OF INSTRUCTION*

M. A. Mason, *Dean*; C. H. Walther, *Assistant Dean*; J. E. Walters, *Director, Engineering Administration Program*

Professors P. A. Crafton, J. B. Ecker, R. A. Hechtman, T. P. G. Liverman, M. A. Mason, Florence Mears, R. H. Moore, C. R. Naeser, Lewis Slack, J. E. Walters, C. H. Walther

Adjunct Professors L. A. Guildner, A. G. McNish, G. U. Sorger

Professorial Lecturers C. H. Conrad, F. P. Hall, F. K. Harris, Laurence Heilprin, Robert Kahal, H. E. Smith, H. L. Stier, R. J. Wilson

* The Staff of Instruction listed here is for the academic year 1960-61. The President of the University, the Dean of Faculties, the Dean of the School and the Assistant Dean in the School, the Registrar of the University, the Director of Admissions of the University, the Professors, Adjunct Professors, Associate Professors, Assistant Professors, and Instructors constitute the Faculty.

Associate Professors G. M. Arkilic, Louis dePian, R. R. Fox, N. T. Grisamore, H. H. Hobbs, John Kaye, A. C. Murdaugh, M. S. Ojalvo
Associate Professorial Lecturer M. C. Soteriades
Assistant Professors E. H. Braun, R. L. Dedrick, C. D. Ferris, J. F. Greenslade, W. J. Mayo-Wells, L. A. Rubin
Lecturers George Abraham, William Alderson, W. W. Balwanz, J. A. Cunningham, Howard Eisner, M. A. Garstens, Milton Gussow, J. R. Miles, Sr., P. S. Morgan, D. C. Rohlf, L. S. Rotolo, P. H. Sawitz, A. H. Schneymann, Richard Van Blerkom
Instructors Sachindranayan Bhaduri, G. V. Luckyj, A. C. Meltzer, R. M. Moore
Associates T. F. Humphrey, T. B. Wiggins

COMMITTEES*

THE DEAN'S COUNCIL†

1962: A. C. Murdaugh, J. E. Walters; 1963: P. A. Crafton, N. T. Grisamore;
 1964: R. R. Fox, C. R. Naeser

COMMITTEE ON ADMISSION AND ADVANCED STANDING

C. H. Walther (*Chairman*), R. R. Fox, M. S. Ojalvo, L. A. Rubin

COMMITTEE ON SCHOLARSHIP

R. R. Fox (*Chairman*), R. L. Dedrick, C. D. Ferris

COMMITTEE ON GRADUATE STUDIES‡

M. A. Mason (*Chairman*), G. M. Arkilic, Louis dePian, M. S. Ojalvo, J. E. Walters

COMMITTEE ON RESEARCH

N. T. Grisamore (*Chairman*), R. L. Dedrick, A. C. Meltzer

GENERAL INFORMATION

INTRODUCTORY

The School of Engineering was organized in 1884 as the Corcoran Scientific School. In 1903 that school was combined with Columbian University in the Department of Arts and Sciences. In 1905 the engineering courses were placed under an administrative organization known as the Washington College of Engineering, and in 1909 the name was changed to the College of Engineering and Mechanic Arts. In 1914 the name became the School of Engineering.

Curricula leading to the degrees of Bachelor of Civil Engineering, Bachelor of Mechanical Engineering, and Bachelor of Electrical Engineering are accredited by the Engineers' Council for Professional Development, the recognized accrediting body of the engineering profession.

OBJECTIVE

The objective of the School of Engineering is to produce graduates who possess knowledge and understanding of the fundamental scientific principles in their fields

* The Dean of the School and the Assistant Dean in the School are members ex officio of all committees. Membership of committees listed here is for the academic year 1960-61.

† Elected by the Faculty.

‡ Appointed by the Dean upon recommendation of the Faculty.

CREDIT

Credit toward a degree is given only after registration for and satisfactory completion of the required work of classes or upon the granting of advanced standing in accordance with the regulations of the School. A student who takes a course as an auditor may not take the same course later for credit.

On request the Registrar will issue to the student a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

HONORS LIST

The Faculty of the School of Engineering recognizes meritorious scholastic achievement by an Honors List, containing in alphabetical order the names of candidates for the certificate or the undergraduate degrees in engineering, whose scholastic achievement satisfies all of the following requirements:

1. The candidate's cumulative quality-point index is equal to or exceeds 3.00.
2. At least 30 semester hours of credit have been earned while a degree candidate in the School of Engineering.
3. At least 15 (part-time student) or 30 (full-time student) semester hours of credit in an engineering degree curriculum have been earned in the two semesters immediately preceding the award.
4. No grade below C has been received during the qualifying period stated above.
5. No disciplinary action has been taken in respect to the student.

The Honors List is prepared at the end of the fall and spring semesters and displayed in an appropriate public place in the School of Engineering. A notation is made on the student's record each time his name is included in an Honors List.

ENGINEERING TECHNOLOGIST CERTIFICATE

This two-year program, which is open to high school graduates, prepares students to assume responsibilities in the field of measurement science.

THE BACHELOR'S DEGREES

The Bachelor's degrees are Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, and Bachelor of Science in Engineering.

The degree of Bachelor of Science in Engineering may be earned with any of the following options: Chemistry, Engineering Administration, Machine Computer, Mathematics, Measurement Sciences, or Physics.

Curricula leading to the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, and Bachelor of Mechanical Engineering are accredited by the Engineers' Council for Professional Development, the recognized accrediting body of the engineering profession.

REQUIREMENTS FOR THE CERTIFICATE AND THE DEGREES

SCHOLARSHIP

A student must maintain a quality-point index of at least 2.00 to be in good academic standing.

A student who fails to maintain the scholarship requirements of the School of Engineering may be suspended from the University.

Mid-semester Warning.—At the end of the seventh week of each semester, instruc-

tors report to the Dean the names of students whose scholarship is unsatisfactory. On receipt of a warning notice the student must consult his instructor and his adviser immediately.

The adviser may prescribe diagnostic tests and/or remedial study to be completed before the end of the current semester.

Probation.—A student whose quality-point index falls below 2.00 is placed on probation. This probation extends over the period in which the student attempts 12 semester hours of study.

A student on probation may be required to follow a program of study, including remedial studies, prescribed by the Committee on Scholarship. He may not hold office, participate in the activities of any student organization, or represent the School in any student activity.

Suspension.—A student whose quality-point index is below 2.00 at the end of his probationary period is suspended. A student whose index falls below 2.00 after removal from probation is suspended.

At the time of his suspension a student may apply to the Committee on Scholarship for guidance concerning remedial action he should take during the period of his suspension.

A student suspended for poor scholarship may apply* to be readmitted in the semester or summer session which begins next after an interval of one calendar year. To be considered for readmission he must pass prescribed tests. A student readmitted after suspension is on probation. He must maintain a current quality-point index of at least 2.50 on each 12 semester hours of work undertaken until his cumulative index is 2.00. In no case will the probationary period after readmission exceed 24 hours of study. A student suspended twice for poor scholarship will not be readmitted.

The foregoing scholarship regulations are applied when a student has completed a minimum of 12 semester hours of work. Thereafter, the regulations are applied in multiples of 12 hours.

USE OF CORRECT ENGLISH

Any student whose written or spoken English in any course is unsatisfactory may be reported by the instructor to the Dean's Council. The Council may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed for failure to make up any such deficiency in English to the satisfaction of the Dean's Council.

RESIDENCE

For the Engineering Technologist Certificate, a minimum of 30 weeks and the last 36 semester hours must be completed in residence.

For the Bachelor's degrees, a minimum of 30 weeks and 36 semester hours must be completed in residence. Summer work may be counted. Unless special permission is granted by the Dean to study elsewhere, the work of the senior or final year must be completed in residence.

* Application for readmission should be made two months in advance to permit the taking and grading of readmission tests.

CURRICULUM REQUIREMENTS

The satisfactory completion of one of the following curricula is required of all students registered for a Bachelor's degree in Engineering except those in the field of Measurement Science. For curricula leading to the Engineering Technologist Certificate and the degree of Bachelor of Science in Engineering with option in Measurement Science, see pages 112 and 113.

Variations from the prescribed curricula may be made, with the permission of the Dean's Council. A student desiring to omit a required course and substitute another must make written application to the Dean presenting satisfactory reasons for the substitution; written approval must be obtained before registration for the course.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return unless during his absence he maintains "in residence" status, see pages 43 and 44.

| FRESHMAN YEAR* | | Semester Hours |
|------------------|----------------------------------|-------------------|
| †Eng. 1 or 1X, 2 | English Composition | 6 |
| Math. 12 | Analytic Geometry | 3 |
| Math. 29, 30, 31 | Calculus I, II, III..... | 9 |
| ME 9 | Introduction to Engineering..... | 3 |
| ME 10 | Graphical Communication | 2 |
| Phys. 11 | Introductory Physics | 3 |
| Phys. 14 | General Physics | 3 |
| Total..... | | 29 |

ROTC.—Air Force ROTC students take Air Science 1-2 and 22 (4).

| SOPHOMORE YEAR | | Semester Hours |
|----------------|---|-------------------|
| Chem. 11-12 | General Chemistry | 8 |
| CE 21 | Rigid Body Mechanics I..... | 3 |
| CE 24 | Strength of Materials..... | 3 |
| EE 11-12 | Fundamentals of Electrical Engineering..... | 6 |
| Math. 111, 112 | Mathematics for Engineers and Physicists I, II..... | 6 |
| Phys. 15, 16 | General Physics | 6 |
| †Elective | In humanities or social studies (see page 105)..... | 3 |
| Total..... | | 35 |

ROTC.—Air Force ROTC students substitute Air Science 11-12 and 51 (4) for Elective (3).

BACHELOR OF CIVIL ENGINEERING

| JUNIOR YEAR | | Semester Hours |
|-------------|---|-------------------|
| CE 112 | Surveying | 3 |
| CE 121 | Rigid Body Mechanics II..... | 3 |
| CE 125 | Engineering Materials | 4 |
| CE 132 | Fluid Mechanics | 3 |
| CE 143-44 | Structural Theory I-II..... | 8 |
| ME 113 | Thermodynamics I | 3 |
| ME 118 | Heat Transfer | 3 |
| Elective | In humanities or social studies (see page 105)..... | 10 |
| Total..... | | 37 |

* Exceptional students may qualify for admission to advanced courses by successfully completing qualifying examinations.

† Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both semesters of the English Composition course; those who are inadequately prepared for English 1 are assigned to English 1X.

‡ B.E.E. candidates may elect Speech 1, English 11, or Psychology 1.

SENIOR YEAR

| | | Semester Hours |
|-------------|--|-------------------|
| CE 128 | Soil Mechanics | 3 |
| CE 135 | Hydraulic Engineering | 3 |
| CE 137 | Applied Earth Sciences | 3 |
| CE 145 | Metal Structures | 3 |
| CE 146 | Reinforced Concrete | 3 |
| CE 154 | Structural Dynamics | 3 |
| CE 157 | Mechanics of Deformable Bodies | 3 |
| CE 165 | Engineering Planning and Organization | 3 |
| CE 168 | Regional and Urban Planning | 3 |
| Elective | In humanities or social studies (see page 105) | 6 |
| *Elective | Technical Elective | 6 |
| Total | | 39 |

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective in humanities or social studies (6).

BACHELOR OF ELECTRICAL ENGINEERING

JUNIOR YEAR

| | | Semester Hours |
|-------------|--|-------------------|
| CE 121 | Rigid Body Mechanics II | 3 |
| CE 132 | Fluid Mechanics | 3 |
| EE 102 | Engineering Electronics | 3 |
| EE 103 | Electric and Magnetic Fields | 3 |
| EE 104 | Field Analysis | 3 |
| EE 107 | Steady-state Network Analysis | 3 |
| EE 111, 112 | Electrical Measurements | 4 |
| EE 113 | Electric Power Laboratory | 2 |
| EE 122 | Measurements and Electronics Laboratory | 2 |
| ME 113 | Thermodynamics I | 3 |
| Phys. 116 | Quantum and Solid State Physics | 3 |
| Elective | In humanities or social studies (see page 105) | 5 |
| Total | | 37 |

SENIOR YEAR

| | | Semester Hours |
|-------------|--|-------------------|
| EE 114 | Electric Power Laboratory | 2 |
| EE 118 | Electrical Energy Conversion | 3 |
| EE 123 | Electronic Devices and Systems Laboratory | 2 |
| EE 124 | High-frequency Communications Laboratory | 2 |
| EE 127 | General Network Analysis and Synthesis | 3 |
| EE 133 | Engineering Analysis | 3 |
| EE 136 | Electromagnetic Waves | 3 |
| EE 137 | Electronic Circuits and Systems | 3 |
| EE 171 | Digital Circuitry and Systems | 3 |
| EE 189 | Undergraduate Thesis in Electrical Engineering | 2 |
| ES 154 | Automatic Control | 4 |
| Elective | In humanities or social studies (see page 105) | 9 |
| Total | | 44 |

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective in humanities or social studies (6).

BACHELOR OF MECHANICAL ENGINEERING

JUNIOR YEAR

| | | Semester Hours |
|--------|-------------------------------|-------------------|
| CE 121 | Rigid Body Mechanics II | 3 |
| CE 125 | Engineering Materials | 4 |
| CE 132 | Fluid Mechanics | 3 |

* B.C.E. candidates elect any courses numbered from 101 to 300 in the sciences or engineering offered at this University.

| | | Semester Hours |
|-------------|---|-------------------|
| EE 102 | Engineering Electronics | 3 |
| ME 100 | Analytical Kinematics | 3 |
| ME 113, 114 | Thermodynamics I, II..... | 6 |
| ME 118 | Heat Transfer | 3 |
| ME 120 | Physical Metallurgy | 3 |
| Phys. 116 | Quantum and Solid State Physics..... | 3 |
| Phys. 191 | Nuclear Reactors | 3 |
| Elective | In humanities or social studies (see page 105)..... | 5 |
| Total..... | | 39 |

| | SENIOR YEAR | Semester Hours |
|-------------|---|-------------------|
| CE 157 | Mechanics of Deformable Bodies..... | 3 |
| ME 123, 124 | Advanced Dynamics I, II..... | 6 |
| ME 135-36 | Thermal Power | 6 |
| ME 139 | Fluid Machinery | 3 |
| ME 143 | Production Analysis | 3 |
| ME 146 | Dynamics of Compressible Fluids..... | 3 |
| ES 154 | Automatic Control | 4 |
| Elective | In humanities or social studies (see page 105)..... | 9 |
| Total..... | | 37 |

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective in humanities or social studies (6).

BACHELOR OF SCIENCE IN ENGINEERING

| | JUNIOR AND SENIOR YEARS (EXCEPT FOR MEASUREMENT SCIENCE) | Semester Hours |
|--------------------------------|---|-------------------|
| CE 121 | Rigid Body Mechanics II..... | 3 |
| CE 125 | Engineering Materials | 4 |
| CE 132 | Fluid Mechanics | 3 |
| EE 102 | Engineering Electronics | 3 |
| EE 103 | Electric and Magnetic Fields..... | 3 |
| ME 100 | Analytical Kinematics | 3 |
| ME 113 | Thermodynamics I | 3 |
| ME 118 | Heat Transfer | 3 |
| ME 120 | Physical Metallurgy | 3 |
| Phys. 116 | Quantum and Solid State Physics..... | 3 |
| Total of Required courses..... | | 31 |
| Option | As approved by the Department of Option and by the Dean | 30 |
| Elective | In humanities or social studies (see page 105)..... | 15 |
| Total..... | | 76 |

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective (3) and option course (3).

The Bachelor of Science in Engineering curriculum provides training in the basic physical principles employed in engineering and in engineering methods of analysis, and in addition, offers an opportunity for study in an optional field in which the student has special interest.

Optional studies can be selected from one or (occasionally) more of the fields of Chemistry, Engineering Administration, Machine Computer, Mathematics, Measurement Science,* or Physics. The program of study in the option is formulated by the department concerned in conference with the student. The program, bearing

* The curriculum in Measurement Science is stated on page 113.

the approval of the Executive Officer of the department concerned, must be submitted by the student to the Dean before the beginning of the junior year.

ELECTIVE IN HUMANITIES AND SOCIAL STUDIES

Required elective courses in the humanities and social studies may be selected from the offerings of the following departments of instruction: Art, Classical Languages and Literatures, English, Germanic Languages and Literatures, Philosophy, Religion, Romance Languages and Literatures, Slavic Languages and Literatures, Economics, Geography, History, Political Science, Sociology and Anthropology.

GRADUATE RECORD EXAMINATIONS

During the final semester of the senior year students in the School of Engineering are required to take the following Graduate Record Examinations: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and the Advanced Test (Engineering) designed to measure the achievement of the college senior in his major field of study. (For further information concerning the Graduate Record Examinations, see page 44.)

THE MASTER'S DEGREES

Upon satisfactory completion of appropriate graduate requirements, the degree of Master of Science in Engineering or Master of Engineering Administration is conferred.

Study for the Master's degree is based upon a faculty-student relationship in which the ability and needs of the individual student are important elements in determining the curriculum. Programs are not restricted to one department or to a single field or type of study. They may include special instruction by assigned members of the engineering faculty or approved courses offered in other colleges and schools of the University. The Committee on Graduate Studies is responsible for establishing each student's program and for providing for its direction.

ADMISSION TO GRADUATE STUDY

For admission to graduate study the student must have a Bachelor's degree from a recognized institution and he must satisfy the Committee on Graduate Studies of his capacity for productive work in the field selected.

Applicants who have significant deficiencies in their preparation may qualify for admission to graduate study by taking prescribed undergraduate courses.

In some cases such study may be carried on in addition to a limited graduate program. In no case may the undergraduate courses fulfill any part of the requirements for the graduate degree.

ADMISSION TO DEGREE CANDIDACY

Application for admission to candidacy for a Master's degree must be made in writing to the Committee on Graduate Studies. To be accepted the applicant must have (1) been accepted for graduate study, (2) satisfactorily completed 9 semester hours of graduate courses, and (3) give evidence of satisfactory personal and intellectual qualifications. In exceptional cases the requirement of 9 semester hours of graduate courses may be reduced.

ADVANCED STANDING

Graduate courses completed before admission are not transferable for degree credit. The Committee on Graduate Studies may, however, consider them in plan-

ning individual programs. Course work to satisfy degree requirements in another school or college of the University may not be so applied in the School of Engineering.

REQUIREMENTS FOR THE DEGREES

Residence

The candidate for a Master's degree must complete a minimum of one year of full-time study, or the equivalent in part-time study, under the direction of the Committee on Graduate Studies. A full-time student must complete all requirements for the degree within three years; a part-time student, within five years.

Scholarship

A minimum grade of "Satisfactory" is required in all courses. A student who makes one grade of "Unsatisfactory" may repeat the course once, or he may appeal to the Committee on Graduate Studies for guidance. A student who receives two or more grades of "Unsatisfactory" will not be permitted to enroll further in the School of Engineering until he demonstrates by examination, or as the Committee may direct, that his deficiencies in course work have been removed. A grade of *B* or better is required for undergraduate courses taken to remove deficiencies in preparation for graduate study.

Master's Thesis

The degree candidate must submit an acceptable thesis to demonstrate his ability to make independent use of the knowledge and discipline of thought acquired and developed by graduate study, and to furnish objective evidence of constructive power in a given field. Work of a suitable character for which the student has professional responsibility may be considered, whether done on or off campus, provided no significant amount of work is completed without faculty supervision.

Comprehensive Examination

To demonstrate substantial understanding of principles and methods of their use in the area of his interest, the student must pass a comprehensive examination, written, oral, or both, as prescribed by the Committee on Graduate Studies. This examination will not be taken until the candidate has successfully completed the prescribed program of study and submitted an acceptable Master's thesis.

THE DEGREE OF MASTER OF SCIENCE IN ENGINEERING

The objective of this discipline is a substantial comprehension of scientific principles and methods for their use, as applied in modern engineering. Increased understanding of engineering science and its use in solving engineering problems are sought, rather than a breadth of familiarity with applications and techniques.

A program of study consisting of (1) at least 24 semester hours of graduate courses to prepare the candidate for his comprehensive examination and (2) a written Master's thesis (6 semester hours) is formulated from the following areas with particular attention to the individual student's needs and objectives. The program may provide for broad coverage in a variety of fields or may be designed to give some degree of specialization in a particular area, as determined by conference with the Committee at the time of admission to candidacy.

The level of the courses ordinarily requires as prerequisite the satisfactory completion of at least one undergraduate course in mathematics beyond the first course in ordinary differential equations and at least one in the area of the graduate course to be undertaken.

REQUIRED COURSES

Upon admission to graduate study, the following courses must be taken prior to application for admission to candidacy for the degree:

ES 211 Analysis of Engineering Systems I (3)

ES 217 Analytical Mechanics (3)

In addition a choice must be made of one or two courses in the areas marked by an asterisk in the Fundamental Engineering group below.

PROGRAM OF STUDY

After admission to candidacy for the degree, the balance of the program may be arranged in consultation with the Committee on Graduate Studies from the following:

Basic

Mathematics.—Theory of functions of a complex variable, mathematical statistics, mathematical probability, vectors, tensors, matrices.

Physics.—Classical field theory, quantum mechanics, solid state physics, nuclear physics.

Applied Mathematics.—Numerical and graphical analysis, advanced mathematics for engineers.

Fundamental Engineering

*Automatic Control
*Elasticity
Elastic Stability
*Electric Networks
*Electromagnetic Fields
Electronics
*Fluid Dynamics
Gas Dynamics
Heat Transfer

*Metrology
Modulation and Noise
Nonlinear Mechanics
Plates and Shells
Plasticity
*Structural Theory
*Thermodynamics
*Transients

Elective

This group consists of courses offered occasionally in such areas as digital computers, high-speed aerodynamics, jet propulsion, potential theory, structural analysis, and transistors. In addition, graduate courses in areas not included in the Basic group offered by the departments of Mathematics, Statistics, Physics, and Chemistry may be taken for degree credit with the approval of the Committee. In general, work in areas which are characterized by a scientific discipline may be accepted in satisfaction of course requirements for the degree of Master of Science in Engineering.

THE DEGREE OF MASTER OF ENGINEERING ADMINISTRATION

The objective of this discipline is to develop an understanding of the principles and a competence in the practices of administration as applied to engineering and scientific activities. Knowledge and understanding are sought rather than mere familiarity with techniques.

A study program is prescribed for each candidate, in accordance with his preparation and objective, by the Committee on Graduate Studies or an assigned adviser. Programs are integrated sequences of courses.

The degree of Master of Engineering Administration is granted upon the successful completion of (1) 30 semester hours of graduate courses, including the written Master's thesis, and (2) the Comprehensive Examination.

PREREQUISITE TO ADMISSION TO GRADUATE STUDY

In addition to the requirements for admission to graduate study stated on page 105, the applicant must have an adequate knowledge of the principles of human relations, the fundamentals of accounting, and the fundamentals of statistics. This requirement can be met by the successful completion of the following undergraduate courses or an approved equivalent: Psychology 145 *Principles of Human Relations*, Accounting 115 *Survey of Accounting*, and Statistics 107 *Statistics for Engineers*.

PROGRAM OF STUDY

The content of the courses immediately following is considered essential knowledge for every candidate for the degree of Master of Engineering Administration. The candidate is required to complete all of the courses except those in which he (1) has successfully completed graduate study or (2) can demonstrate to the Committee on Graduate Studies an acceptable knowledge of the course field. The following Engineering Administration courses must be taken prior to admission to candidacy: 201 *Engineering Administration I*, 202 *Engineering Administration II*, and 271 *Operations Research*.

| | | Semester Hours |
|------------|------------------------------------|-------------------|
| EA 201 | Engineering Administration I..... | 3 |
| EA 202 | Engineering Administration II..... | 3 |
| EA 271 | Operations Research | 3 |
| EA 299-300 | Master's Thesis | 6 |

The following courses provide knowledge in certain special areas which are significant in engineering administration. The candidate is required to select at least two; it is preferable that he elect three.

| | | Semester Hours |
|-----------|--|-------------------|
| EA 206 | Human Relations in Administration..... | 3 |
| EA 251 | Management of Research and Development..... | 3 |
| EA 252 | Production and Maintenance Management..... | 3 |
| Stat. 262 | Managerial Statistics and Quality Control..... | 3 |

Elective

Courses are to be elected to provide a total of 30 semester hours for the program.

| | | Semester Hours |
|---------------|--|-------------------|
| EA 261 | Economic Analysis in Engineering Planning..... | 3 |
| EA 263 | Quantitative Techniques of Engineering Administration..... | 3 |
| EA 272 | Problems in Operations Research..... | 3 |
| EA 273-74 | Techniques of Operations Research..... | 6 |
| EA 285 | Seminar on Administrative Problems..... | 3 |
| EA 295 | Applied Research in Engineering Administration (arr.) | |
| EA 296 | Research in Engineering Administration (arr.) | 3 |
| Acct. 215 | Survey of Managerial Accounting..... | 3 |
| Acct. 293 | Budget Preparation and Control..... | 3 |
| Bus. Adm. 250 | Contract Administration | 3 |
| Pub. Adm. 213 | Administration in Government..... | 3 |

Stat. 271-72
Elective

Statistical Information Theory..... 6
(To be selected from Engineering or the sciences), as approved by the Committee on Graduate Studies.....3-6

THE DOCTORAL PROGRAM

INTRODUCTORY

The School of Engineering offers a program of advanced study and research leading to the degree of Doctor of Science. This program is limited to recognized engineering fields in which a scientific discipline exists and for which the University has adequate resources.

The Doctoral discipline is designed to prepare the student for a career of creative scholarship by providing a broad background of knowledge and an understanding of research methods. It requires study of interrelated fields of learning as well as original research in the engineering field of central interest.

The discipline for the degree is divided into two stages. The first—made up of a study of interrelated fields of learning which support the general area of research concentration—culminates in the qualifying examination. The second—composed of research investigation of a particular subject in a special field and the presentation of such research findings in a written dissertation—culminates in the final examination.

Detailed information on the program is provided in a separate publication obtainable on request.

ADMISSION

The applicant must have adequate preparation for advanced study, including a satisfactory Master's degree, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship. The applicant must have capabilities and interests beyond the ability to assimilate organized materials in formal courses of instruction. Originality of mind combined with balanced judgment and accuracy in observation or experiment are necessary to the successful applicant.

Language Requirements

A reading knowledge is required of two foreign languages important in the student's field of interest. One language examination must be passed before admission to graduate study. The second must be passed before admission to the qualifying examination and within one year of the start of study for the qualifying examination.

Application for Admission

Well in advance of the opening of the semester for which the student seeks admission, he must have a personal interview with the Chairman of the Committee on Graduate Studies or the professor under whom he wishes to study to discuss the field of study, the University's facilities for guidance in this field, the applicant's qualifications, and the possibilities of an effective doctoral program. If an application for admission is indicated, the student will be advised concerning the details of application procedure.

STUDY FOR THE QUALIFYING EXAMINATION

Upon admission to study for the qualifying examination the student's admission committee becomes his Consultative Committee, which prescribes and directs his studies. The Committee assigns to him a group of fields of learning deemed nec-

essary to insure his breadth of knowledge, as well as to support research in his central field. Members of the Committee advise the student concerning the scope and content of these fields of study, which are generally more inclusive and intensive than courses of instruction announced in the University catalogue, and will guide him in preparation for his examination in them.

The purpose of the qualifying examination is to ascertain that the student's breadth of background and intellectual development are adequate to support doctoral research and investigation in his central field. The qualifying examination is both written and oral and usually extends over a period of six days. It is given by a special committee consisting of members of the student's Consultative Committee and other scholars. Upon favorable report of the examiners to the Committee on Graduate Studies the student is admitted to candidacy for the degree, to pursue his specialized study and research under the supervision of a designated member of the Faculty.

The examination is the sole test of the student's ability to qualify for admission as a candidate for the degree, and to enter the second stage of his doctoral discipline.

RESEARCH, THE DISSERTATION, AND THE FINAL EXAMINATION

The student admitted to candidacy for the degree requests as Master in Research the member of the Faculty under whom he wishes to pursue research and specialized study. The Faculty member may accept or reject such request. The research is arranged by the Master and approved by the Committee on Graduate Studies. Throughout the remainder of the doctoral program, the candidate is responsible solely to his Master in his research and in the presentation of his dissertation.

A dissertation is required as evidence of ability to perform scholarly research and to interpret and present its results. Upon approval of the dissertation (see pages 44-45) by the Master, the candidate is presented for his final examination. The summaries of accepted dissertations are printed in a numbered issued of the University BULLETIN. The successful candidate is required before receiving his degree to pay a fee to cover the expense of the printing of the summary of his dissertation.

The final examination is oral and is open to the public. The candidate must demonstrate a mastery of his special field of interest and of the materials and techniques used in the research. The committee of examiners includes members of the Committee on Graduate Studies competent in the research field or in closely related subjects and may also include qualified experts brought to the University especially to participate in the examination. If the candidate satisfies the examining committee concerning the high quality and originality of his contribution to knowledge as well as his mastery of the scholarship and research techniques of his field, the Committee on Graduate Studies recommends him for the degree of Doctor of Science.

RESIDENCE AND CONTINUOUS STUDY

All of the work for the degree must be done in residence (on the campus), except in certain circumstances when the student may be permitted to undertake a portion of the research problem in an approved off-campus facility. The student must maintain continuous registration in the School of Engineering, even when the Committee on Graduate Studies has granted a leave of absence. Failure to maintain registration in each semester of the academic year disrupts the residence status of the student, and he must apply for readmission to graduate study under whatever new conditions and regulations are set up by his consultative committee.

There is no formal regulation concerning the minimum amount of time to be spent in preparation for the qualifying examination or as a candidate engaged in doctoral research. The qualifying examination, however, must be completed within five years of the date of admission, and the entire degree program must be completed within seven years. After admission the student may apply for his qualifying examination whenever his consultative committee believes that he is prepared to take it; his research and specialized study may be undertaken with whatever concentration of time meets the approval of his research adviser. Normally a minimum of two years of full-time study and research is spent in meeting the requirement for the degree.

THE CENTER FOR MEASUREMENT SCIENCE

The Center which is under the direction of the School of Engineering is a cooperative activity of the University, industry, and government providing education, research, and service programs related to measurement. It was established by the University in 1960, with the collaboration of the National Bureau of Standards and the financial support of a grant from The Martin Company of Baltimore, Maryland.

The principal, but not exclusive, activities of the Center are:

The education of persons for careers in measurement science;

The development and improvement of measurement, standardization, and calibration techniques, apparatus, and data—with particular reference to high precision.

The provision of staff and facilities available to industry for research and consultation on measurement problems in industry, and including the maintenance of primary standards of measurement directly traceable to the national standards.

The publication of results of research, manuals of practice and procedures, and information related to measurement science.

Through these and other activities the Center serves as a source of personnel competent in measurement science, as an instrument for collaborative research on measurement problems, and as a service organization providing expert capability to industrial and government organizations in the solution of their measurement problem.

THE EDUCATION PROGRAM

The Education Program of the Center consists in part of four curricula offered by the School of Engineering, which prepare the student to assume responsibilities in the field of measurement science. The curricula are integrated, to permit a student to terminate his formal education at any level, or to proceed to the next level. Programs lead to the Engineering Technologist Certificate and the degrees of Bachelor of Science in Engineering, Master of Science in Engineering, and Doctor of Science.

In addition to the certificate and degree programs, the education program includes seminars, special conferences, and short courses offered from time to time for the benefit of Associate personnel. Announcements of these events are sent in advance to Associates.

THE RESEARCH PROGRAM

The research program of the Center includes all aspects of research and development related to measurement science. Research and/or development may be undertaken as independent studies by staff members for the Center, as studies for a sponsor

under contract, or by personnel of Associates of the Center assigned to the Center to undertake the specific work. Associates receive publications of the Center; certain publications may be restricted in distribution.

THE SERVICE PROGRAM

The Service Program of the Center provides a mechanism for obtaining consultation and assistance of the faculty, staff, and facilities of the Center in connection with specific problems in measurement. The program is restricted to the use of the Associates of the Center.

Additionally the Service Program makes it possible for Associates to engage the various resources of the University, through the Center, as may be desirable and feasible, in solution of their problems in measurement.

For complete information concerning the Center for Measurement Science, see the bulletin, which is available upon request to the Director of the Center for Measurement Science, Tompkins Hall, 725 Twenty-third Street, NW., Washington 7, D. C., FEderal 8-0250, Extension 246.

ENGINEERING TECHNOLOGIST CERTIFICATE

This is a two-year program open to high school graduates.

Regulations governing students enrolled in the Engineering Technologist program are stated on pages 99-100 and 100-101.

Curriculum

FIRST YEAR

| | | Semester Hours |
|------------------|-----------------------------------|-------------------|
| Chem. 11-12 | General Chemistry | 8 |
| Engl. 1 or 1X | English Composition | 3 |
| Math. 12 | Analytic Geometry | 3 |
| Math. 29, 30, 31 | Calculus I, II, III | 9 |
| Physics 11 | Introductory Physics | 3 |
| Physics 14 | General Physics | 3 |
| ME 9 | Introduction to Engineering | 3 |
| ME 10 | Graphical Communication | 2 |
| | Total | 34 |

SECOND YEAR

| | | |
|----------------|--|-----------|
| CE 21 | Rigid Body Mechanics I | 3 |
| CE 24 | Strength of Materials | 3 |
| CE 121 | Rigid Body Mechanics II | 3 |
| EE 11-12 | Fundamentals of Electrical Engineering | 6 |
| Math. 111 | Mathematics for Engineers and Physicists I | 3 |
| Metr. 1 | Foundations of Metrology | 3 |
| Metr. 2 | Measurements Laboratory I | 3 |
| *Metr. 3 | Measurements Laboratory II | 3 |
| Metr. 4 | Introduction to Statistics for Metrology | 3 |
| Physics 15, 16 | General Physics | 6 |
| | Total | 36 |

* Students intending to continue study toward the degree of Bachelor of Science in Engineering should substitute Mathematics 112 for Metrology 3.

BACHELOR OF SCIENCE IN ENGINEERING

MEASUREMENT SCIENCE OPTION

Regulations governing students enrolled in this program are stated on pages 99-100 and 100-101.

Curriculum

The curriculum for the first two years is the same as that stated above, for the Engineering Technologist Certificate.

| JUNIOR YEAR | | Semester Hours |
|-------------|--|-------------------|
| CE 132 | Fluid Mechanics | 3 |
| EE 102 | Engineering Electronics | 3 |
| EE 103 | Electric and Magnetic Fields..... | 3 |
| EE 104 | Field Analysis | 3 |
| ME 113 | Thermodynamics I | 3 |
| ME 118 | Heat Transfer | 3 |
| Metr. 3 | Measurements Laboratory II..... | 3 |
| Metr. 113 | Introduction to Transducers and Instrumentation..... | 2 |
| Elective | In humanities or social studies..... | 9 |
| Total..... | | 32 |

| SENIOR YEAR | | |
|--------------|--|----|
| CE 125 | Engineering Materials | 4 |
| ME 100 | Analytical Kinematics | 3 |
| ME 120 | Physical Metallurgy | 3 |
| Metr. 111-12 | Precise Electrical Measurements I, II..... | 6 |
| Metr. 114 | Advanced Transducers and Instrumentation II..... | 3 |
| Metr. 121 | Precise Mechanical Measurements..... | 4 |
| Metr. 131 | Precise Heat Measurements..... | 4 |
| Physics 116 | Quantum and Solid State Physics..... | 3 |
| Elective | In humanities or social studies..... | 5 |
| Total..... | | 35 |

GRADUATE DEGREES

Graduate programs in Measurement Science are offered, which lead to the degrees of Master of Science in Engineering (see pages 106-7) and Doctor of Science (see pages 109-11).

THE SCHOOL OF PHARMACY

THE FACULTY AND STAFF OF INSTRUCTION*

C. W. Bliven, *Dean*; R. M. Leonard, *Assistant Dean*

Professors C. W. Bliven, I. B. Hansen, C. A. M. Hogben, R. D. Kennedy, G. M. Koehl, R. H. Moore, R. B. Stevens, C. R. Treadwell, R. C. Vincent
Associate Professors Rudolph Hugh, C. J. Kokoski, R. M. Leonard, S. M. Schwartz
 J. W. Skinner

* The President of the University, the Dean of Faculties, the Dean and Assistant Dean of the School, the Registrar of the University, the Director of Admissions of the University, Professors, Associate Professors, and Assistant Professors constitute the Faculty.
 This listing of the Faculty and Staff of Instruction is for the academic year 1960-61.

Associate Professorial Lecturer C. G. Frailey

Assistant Professors F. D. Cooper, G. G. Koustenis

Special Lecturers W. S. Apple, G. F. Archambault, Karl Bambach, W. P. Briggs, C. J. Carr, E. G. Feldman, D. L. Finucane, L. E. Kazin, F. C. McAleer, M. L. Yakowitz

COMMITTEES*

THE DEAN'S COUNCIL†

I. B. Hansen, C. J. Kokoski, S. M. Schwartz

COMMITTEE ON SCHOLARSHIP

R. C. Vincent (*Chairman*), R. M. Leonard, G. G. Koustenis

COMMITTEE ON ADMISSION AND ADVANCED STANDING

R. M. Leonard (*Chairman*), S. M. Schwartz, C. J. Kokoski

ADVISORY COMMITTEE

I. A. Tennyson (*Chairman*), J. E. Allen, Howard Bradbury, W. P. Briggs, M. H. Bortnick, M. L. Elsberg, D. I. Estrin, F. R. Franzoni, R. D. Gibba, M. G. Goldstein, A. J. Obert

GENERAL INFORMATION

INTRODUCTORY

In 1867 the foundation for the National College of Pharmacy was laid by the Apothecaries' Association of the District of Columbia. The College was opened in 1872 and continued until 1906, when it became affiliated with The George Washington University.

The School of Pharmacy is accredited by the American Council on Pharmaceutical Education. It is a member of the American Association of Colleges of Pharmacy.

Washington offers many opportunities for the student of pharmacy. The American Institute of Pharmacy, the headquarters of the American Pharmaceutical Association, is only a few blocks from the School of Pharmacy. The Institute also houses a pharmaceutical museum, a library, and research laboratories. Government agencies and laboratories whose activities are closely allied to pharmacy, and the government libraries, the facilities of which are open to the student, are readily accessible.

The Institute and the Federal Government bring to Washington leaders in the fields of pharmacy, many of whom present to senior students current professional information.

The objectives of the School of Pharmacy are (1) to train professionally competent pharmacists, primarily for retail practice, and to help them acquire specialized training, a general education, and an attitude of responsibility to their profession and to society; (2) to promote the health profession of pharmacy in general, and particularly within the community.

To achieve these objectives, the School has developed a systematic plan of in-

* The Dean and Assistant Dean of the School of Pharmacy are members ex officio of all committees.
† Elected by the Faculty.

struction for the professional courses. In the four-year curriculum, they are integrated with the liberal arts program; in the five-year curriculum, the professional work is based on a two-year preprofessional program of basic science and liberal arts. It further encourages student participation in University, professional, and civic organizations and activities which increase professional competence, raise professional standards, and help develop social responsibility.

REGULATIONS

Students in the School of Pharmacy are subject to and are expected to familiarize themselves with the regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES as stated on pages 9-23, and the University regulations stated on pages 40-46.

Students registered in the Junior College Pharmacy curriculum are subject to the regulations of the Junior College. However, in the professional course of that curriculum, the attendance requirements of the School of Pharmacy prevail.

AMOUNT OF WORK

Normal work for any year is that outlined under the head of "Curriculum Requirements", below. A student who wishes to take more than the normal amount of work may do so only with the permission of the Committee on Scholarship, the members of which are guided in their decision by his scholastic record and the extent to which he is employed. A student on probation is limited in the number of semester hours he may carry.

The student is not encouraged to undertake outside employment while attempting a full course of study. A student who maintains a general quality-point index of 2.00 or higher and an index of 2.50 in pharmacy courses may be granted permission by the Dean to undertake outside employment. The amount of employment permitted is governed by the scholarship record of the student and the number of semester hours for which he is registered.

A student who accepts employment after registration or at any time during the semester must report immediately to the Dean so that his program may be adjusted, if necessary.

ATTENDANCE

Except by special permission of the instructor, credit will not be given for any pharmacy course if absences, including both lecture and laboratory, exceed in number for each semester the hours of credit for the semester. If a course has distinct divisions such as lectures, laboratories, or recitations, the absences apply pro rata to such divisions.

EXAMINATIONS BEFORE STATE BOARDS OF PHARMACY

To be eligible for examination before state boards of pharmacy, the applicant is required to present satisfactory evidence of graduation from a college of pharmacy. In addition, most states require one year of practical experience in a pharmacy. This experience may not be gained concurrently with the school year. In some states, a portion of it must be obtained following graduation.

THE DEGREE OF BACHELOR OF SCIENCE IN PHARMACY

The School of Pharmacy offers curricula leading to the degree of Bachelor of Science in Pharmacy.

REQUIREMENTS FOR THE DEGREE

SCHOLARSHIP

The system of grading and of computing scholarship is described in detail on pages 40 and 41.

In order to graduate, a student must have a general quality-point index of at least 2.00. In addition, he must have an index of at least 2.50. in all pharmacy courses.

Probation.—A student must maintain a general quality-point index of 2.00 and a pharmacy index of 2.50 or be placed on probation.

The following scholarship rules on general quality-point index are applied when a student has undertaken a multiple of 9 semester hours. Those on the pharmacy index are applied when he has completed 12 pharmacy hours and thereafter are applied in multiples of 9 hours.

First Probation.—A student is placed on first probation when his general quality-point index is below 2.00 or his pharmacy index is below 2.50. (See also under "Suspension".)

Second Probation.—A student who has a general quality-point index below 2.00 or a pharmacy index below 2.50 after a multiple of 9 semester hours is placed on second probation. However, a student who has a general index between 1.50 and 2.00 or a pharmacy index between 2.20 and 2.50 is considered by the Committee on Scholarship. In each case, the Committee may retain him on probation or suspend him.

Suspension.—A student who has a general quality-point index below 1.50 or a pharmacy index below 2.20 is suspended. However, a student who has a general index between 1.40 and 1.50 or a pharmacy index between 2.00 and 2.20 is considered by the Committee on Scholarship. In each case, the Committee may retain him on probation or suspend him.

A student subject to probation for the third time, whether successive or after an interval, is suspended. In considering a student for suspension, the rules on probation apply to the general and to the pharmacy index independently.

A student suspended for poor scholarship may apply for readmission after an interval of a calendar year. He must then submit evidence to the Dean that during his absence from the University he has so conducted himself as to indicate that he will profit by readmission. A Student suspended twice for poor scholarship will not be readmitted.

CURRICULUM

The curriculum, including the two-year pre-pharmacy curriculum (see page 53) requires five years. The last two years of the four-year curriculum are available only to those students who were admitted to this program by or before September 1960, and who intend to receive the degree by April 1, 1965.

Both the four- and five-year curricula are given below.

Four-year Curriculum.—The curriculum requirements include at least 141 semester hours. The following curriculum leads to the degree of Bachelor of Science in Pharmacy.

Junior Year: Fall Semester

| Courses | Did. hrs. | Lab. hrs. | Sem. hrs. | Clock hrs. |
|---------------------|-----------|-----------|-----------|------------|
| Chemistry 21..... | 32 | 96 | 4 | 128 |
| Pharmacy 101..... | 32 | 48 | 3 | 80 |
| Pharmacy 105..... | 32 | .... | 2 | 32 |
| Pharmacy 107..... | 48 | .... | 3 | 48 |
| Physiology 115..... | 48 | .... | 3 | 48 |
| Physiology 117..... | .... | 48 | 1 | 48 |
| Total..... | 192 | 192 | 16 | 384 |

Junior Year: Spring Semester

| | | | | |
|-----------------------|-----|------|----|-----|
| Chemistry 22..... | 32 | 96 | 4 | 128 |
| Microbiology 112..... | 48 | 96 | 4 | 144 |
| Pharmacy 102..... | 32 | 96 | 4 | 128 |
| Pharmacy 106..... | 32 | .... | 2 | 32 |
| Pharmacy 110..... | 48 | .... | 3 | 48 |
| Total..... | 192 | 288 | 17 | 480 |

Senior Year: Fall Semester

| | | | | |
|------------------------|-----|------|----|-----|
| *Biochemistry 221..... | 32 | 96 | 4 | 128 |
| Pharmacy 103..... | 32 | 96 | 4 | 128 |
| Pharmacy 111..... | 48 | .... | 3 | 48 |
| Pharmacy 165..... | 48 | .... | 3 | 48 |
| Elective | 48 | .... | 3 | 48 |
| Total..... | 208 | 192 | 17 | 400 |

Senior Year: Spring Semester

| | | | | |
|------------------------|------|------|-----|------|
| *Biochemistry 222..... | 32 | 96 | 4 | 128 |
| Microbiology 210..... | 32 | .... | 2 | 32 |
| Pharmacy 166..... | 32 | 64 | 3 | 96 |
| Pharmacy 176..... | 32 | .... | 2 | 32 |
| Pharmacy 178..... | 64 | .... | 4 | 64 |
| Pharmacy 188..... | 48 | .... | 1 | 48 |
| Pharmacy 190..... | 16 | .... | 1 | 16 |
| Pharmacy 192..... | .... | 48 | 1 | 48 |
| Total..... | 256 | 208 | 18 | 464 |
| Grand Total..... | 1728 | 1536 | 141 | 3264 |

* Students planning to do graduate work may request the substitution of other courses for Biochemistry 221-22 if this course will be included in the graduate curriculum.

The Five-year Curriculum.—The Junior College Pharmacy curriculum comprises the first two years of the five-year pharmacy course (see page 53). This curriculum satisfies the pre-professional needs of the School of Pharmacy and the general cultural requirements of the Junior College.

The curriculum requirements include at least 161 semester hours. The following curriculum leads to the degree of Bachelor of Science in Pharmacy.

First and Second (Pre-Pharmacy) Years

| Courses | Did hrs.* | Lab. hrs.* | Sem. hrs. | Clock hrs.* |
|--|-----------|------------|-----------|-------------|
| Courses in the Junior College (see page 53)..... | 800 | 464 | 64 | 1264 |

Third Year: Fall Semester

| Courses | Did. hrs. | Lab. hrs. | Sem. hrs. | Clock hrs. |
|---------------------|-----------|-----------|-----------|------------|
| Chemistry 21..... | 32 | 96 | 4 | 128 |
| Pharmacy 121..... | 48 | 48 | 4 | 96 |
| Pharmacy 125..... | 48 | .... | 3 | 48 |
| Physiology 115..... | 48 | .... | 3 | 48 |
| Physiology 117..... | .... | 48 | 1 | 48 |
| Total..... | 176 | 192 | 15 | 368 |

Third Year: Spring Semester

| | | | | |
|-----------------------|-----|------|----|-----|
| Chemistry 22..... | 32 | 96 | 4 | 128 |
| Microbiology 112..... | 48 | 96 | 4 | 144 |
| Pharmacy 122..... | 32 | 96 | 4 | 128 |
| Pharmacy 126..... | 48 | .... | 3 | 48 |
| Total..... | 160 | 288 | 15 | 448 |

Fourth Year: Fall Semester

| | | | | |
|-----------------------|-----|------|----|-----|
| Biochemistry 221..... | 32 | 96 | 4 | 128 |
| Pharmacy 101..... | 32 | 48 | 3 | 80 |
| Pharmacy 110..... | 48 | .... | 3 | 48 |
| Pharmacy 127..... | 32 | 48 | 3 | 80 |
| Elective..... | 48 | .... | 3 | 48 |
| Total..... | 192 | 192 | 16 | 384 |

* Exclusive of Physical Education.

Fourth Year: Spring Semester

| Courses | Did. hrs. | Lab. hrs. | Sem. hrs. | Clock hrs. |
|-----------------------|-----------|-----------|-----------|------------|
| Biochemistry 222..... | 32 | 96 | 4 | 128 |
| Microbiology 210..... | 32 | .... | 2 | 32 |
| Pharmacy 111..... | 48 | .... | 3 | 48 |
| Pharmacy 112..... | 48 | 48 | 4 | 96 |
| Pharmacy 164..... | 48 | .... | 3 | 48 |
| Total..... | 208 | 144 | 16 | 352 |

Fifth Year: Fall Semester

| | | | | |
|-------------------|-----|------|----|-----|
| Pharmacy 102..... | 32 | 96 | 4 | 128 |
| Pharmacy 107..... | 48 | .... | 3 | 48 |
| Pharmacy 109..... | 10 | 6 | 1 | 16 |
| Pharmacy 115..... | 48 | .... | 3 | 48 |
| Pharmacy 165..... | 48 | .... | 3 | 48 |
| Elective | 48 | .... | 3 | 48 |
| Total..... | 234 | 102 | 17 | 336 |

Fifth Year: Spring Semester

| | | | | |
|-------------------|------|------|-----|------|
| Pharmacy 103..... | 32 | 96 | 4 | 128 |
| Pharmacy 166..... | 48 | 64 | 4 | 112 |
| Pharmacy 176..... | 48 | .... | 3 | 48 |
| Pharmacy 178..... | 64 | .... | 4 | 64 |
| Pharmacy 188..... | 48 | .... | 1 | 48 |
| Pharmacy 190..... | 16 | .... | 1 | 16 |
| Pharmacy 192..... | .... | 48 | 1 | 48 |
| Total..... | 256 | 208 | 18 | 464 |
| Grand Total..... | 2026 | 1590 | 161 | 3616 |

THE DEGREE OF MASTER OF SCIENCE IN PHARMACY*

The School of Pharmacy offers a program leading to the degree of Master of Science in Pharmacy.

DEFINITION OF THE MASTER'S WORK

The study leading to the degree of Master of Science in Pharmacy is a comprehensive survey of one or more of the fields of knowledge embraced by Pharmacy. It is a continuation of the work of the student's undergraduate major and involves a greater acquaintance with scholarly method.

The student must satisfy certain minimum requirements as to previous prepara-

* Courses applicable to this degree are not offered in 1961-62.

tion, residence, ability to read an approved modern foreign (European) language, and courses taken; but these requirements, while essential, are regarded primarily as qualifying measures. The student's knowledge of his field, as demonstrated by his thesis and by the results of his Master's examination (together with such other examinations involving special skills or techniques as may be required), is the basis upon which the Master's degree is conferred. The foreign language requirement may be waived by faculty action in the instance of students whose field of study at the Master's level may not require such preparation.

REQUIREMENTS FOR THE DEGREE

RESIDENCE

An academic year of residence is required, i.e., completion of a minimum of 30 semester hours of work including the thesis, which is counted as the equivalent of 6 hours of course work. Summer work may be counted in residence, but in no case may the period of residence aggregate less than twenty-seven weeks. Not more than 12 hours (which must be approved in advance by the Dean) may be taken in another school or division of this University, and such work may not be counted toward both a degree in that school and the Master's degree in the School of Pharmacy.

AMOUNT OF WORK

A student whose previous preparation in his chosen field has been adequate may complete his requirements, including the thesis, by a minimum of 30 semester hours; others are required to do additional work. First-group courses may not be credited toward the Master's degree. Pharmacy courses numbered below 200 may be credited toward the Master's degree only when registration for graduate credit has been approved at the beginning of the course by the instructor and the Dean.

ADMISSION TO CANDIDACY

In addition to admission requirements stated on page 16 the applicant for admission to candidacy for the Master's degree must be approved by the appropriate representative of the Department of Pharmacy and by the Dean.

SCHOLARSHIP

A student whose scholarship is considered unsatisfactory may be suspended by the Dean upon recommendation of the staff member under whom the student is working.

THE THESIS

The thesis may be of a research, expository, critical, or creative type.

The main purpose of a Master's thesis is to demonstrate the student's ability to make independent use of the information and training acquired through his other disciplines, and to furnish objective evidence of his constructive powers in his chosen field. Registration for the thesis must be no later than the beginning of the final year of preparation, unless the professor in charge of the thesis permits registration at the beginning of the final semester. The choice of the thesis subject must be approved by the professor in charge of the student's field and recorded in the Office of the Registrar by the date announced in the University calendar. Registration for the thesis is ordinarily made on the basis of 3 semester hours for two successive semesters. In exceptional cases, and with the approval of the professor in charge of the thesis, the student may register for the entire 6 hours during a single se-

mester. The thesis in its final form must have the approval of the professor in charge of the student's field and must be presented to the Dean by the student no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis (see pages 44-45) are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period the student must register for it again, and pay tuition on the same basis as for a repeated course.

FINAL EXAMINATION

In addition to the course examinations, the candidate must pass a final examination on the thesis and its related fields. This examination may be either written or oral at the discretion of the Faculty.

If the thesis is submitted more than three years after the course requirements have been completed, a written examination covering the student's complete program of study will also be required.

THE SCHOOL OF EDUCATION

THE FACULTY AND STAFF OF INSTRUCTION*

J. H. Fox, *Dean*; B. S. Root, *Assistant Dean*; A. C. LaBue, *Assistant Dean*

Professors G. L. Angel, H. F. Bright, Elizabeth Burtner, Mitchell Dreese, D. C. Faith, J. H. Fox, Thelma Hunt, B. H. Jarman†, Frances Kirkpatrick, J. H. Krupa, A. C. LaBue, Helen Lawrence, C. E. Leese, G. E. McSpadden, W. H. Myers, C. W. Pettit‡, B. S. Root, Kathryn Towne

Professorial Lecturers D. D. Darland, John Holden, Clayton Hutchins, Robert Jacobs, H. O. Johnson, B. D. Joy, Florence Lumsden, Anthony Marinaccio, Madaline Remmlein, D. W. Snader, J. P. Walsh

Associate Professors J. G. Allee, Jr., Mary Coleman, V. J. DeAngelis, R. G. Hanken, Eva Johnson, W. A. McCauley, Carol St. Cyr, Mildred Shott, Loretta Stallings

Associate Professorial Lecturers Beverly Crump, J. C. Lang, Eugenia Nowlin, R. R. Rued, Mary Scott, Clara Stratemeyer, LuVerne Walker, H. M. Wilson

Assistant Professors R. E. Baker, H. G. Detwiler, Lyndale George, W. A. Smith, Jeanne Snodgrass

Lecturers Pat Abernethy, R. W. Eller, H. D. Gardner, John Giancaspro, W. H. Hayes, Jr., Zella Huse, E. M. Logan, C. O. McDaniels, R. R. Roberts, W. D. Thompson, J. W. Tyler, Ward Whipple, Hazel Wilson

Instructors Joyce Fuller, Connie Vaughan

* The President of the University, the Dean of Faculties, the Dean and Assistant Deans of the School, the Registrar of the University, the Director of Admissions of the University, Professors, Associate Professors, Assistant Professors, and Instructors constitute the Faculty.

† This listing of the faculty and Staff of Instruction is for the academic year 1960-61.

‡ On leave of absence 1960-61.

§ On sabbatical leave spring semester 1960-61.

FIELD STUDIES

Director J. W. Charles; Assistant Director D. T. McNelis

FIELD SERVICE COORDINATORS

Alexander Anderson, Assistant Principal, Washington-Lee High School, Arlington, Va.; Mary Maré, Assistant Principal, Dean of Girls, Wakefield High School, Arlington, Va.; C. M. Richmond, Principal, Stratford Junior High School, Arlington, Va.

COMMITTEES*

THE DEAN'S COUNCIL†

1962: R. E. Baker, W. A. McCauley, 1963: W. H. Myers, Loretta Stallings;
1964: Lyndale George, Kathryn Towne

COMMITTEE ON GRADUATE STUDIES‡

J. H. Fox (Chairman), G. L. Angel, Mitchell Dreese, D. C. Faith, Thelma Hunt, A. C. LaBue, W. A. McCauley, B. S. Root, Carol St. Cyr

COMMITTEE ON ADMISSION AND ADVANCED STANDING‡

J. H. Fox (Chairman), J. H. Krupa, B. S. Root, J. Y. Ruth, Loretta Stallings, Kathryn Towne

COMMITTEE ON SCHOLARSHIP

B. S. Root (Chairman), V. J. DeAngelis, Helen Lawrence, Kathryn Towne

GENERAL INFORMATION

INTRODUCTORY

It is the purpose of the School of Education to prepare teachers, counselors, and administrators for the higher ranges of educational service and to offer opportunities to teachers of experience to extend their education. The School includes the departments of Education, Physical Education, and Home Economics. It offers both graduate and undergraduate work. Other departments of the University provide general education and teaching field courses needed for a well-balanced program of teacher education.

The schedule of courses is arranged to meet the convenience of both full-time and part-time students. By attending evening, Saturday, and summer classes, teachers in the schools of the metropolitan Washington area and others within commuting range may complete all the requirements for a degree without giving up their positions.

REGULATIONS

Students in the School of Education are subject to, and are expected to familiarize themselves with, the regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 9-23, and the University regulations stated on pages 40-46.

AMOUNT OF WORK

Fifteen to 17 semester hours of credit constitute a normal program. A student with a quality-point index of 3.00 or higher, may, with the permission of the Dean,

* The Dean and Assistant Deans of the School of Education are members ex officio of all committees.
† Elected by the Faculty.
‡ Appointed by the Dean.

enroll for 18 or 19 hours. No student may enroll for more than 19, except by permission of the Committee on Scholarship.

A student employed 15 hours or less a week may carry a normal program of college work.

A student employed from 16 to 25 hours a week may enroll for 12 or 13 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 15 or 16 hours.

A student employed from 26 to 34 hours a week may enroll for 9 or 10 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 12 or 13 hours.

A student employed 35 hours or more a week may enroll for 6 or 7 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 9 or 10 hours.

A student who increases his hours of employment after registration or at any time during a semester must report immediately to the Dean so that his program may be adjusted, if necessary.

THE BACHELOR'S DEGREES

The School of Education offers programs leading to the degrees of Bachelor of Arts in Education, Bachelor of Science in Home Economics, and Bachelor of Science in Physical Education.

The program of each student must be approved by a Faculty adviser. Since each student's program is defined by his particular needs, it is important that the student have a clear concept of his major interest in education, and also that he be familiar with the teaching-certificate requirements of the locality in which he expects to teach.

REQUIREMENTS FOR THE DEGREES

To be recommended for a degree a student must satisfy the admission, residence, scholarship, and curriculum requirements.

RESIDENCE

Candidates for the Bachelor's degrees must complete satisfactorily while matriculated in the School of Education a minimum of 30 semester hours, 9 of which, with the approval of the adviser, may be in the Off-Campus Division of the College of General Studies.

For full details concerning registration, see pages 43 and 44.

SCHOLARSHIP

The system of grading and of computing scholarship is described in detail on pages 40 and 41.

In order to graduate, a student must have a quality-point index of at least 2.00.

Probation.—A student who fails to maintain a quality-point index of at least 2.00 is placed on probation. He remains on probation as long as his index is below 2.00, or until his probation is removed by the Committee on Scholarship.

Suspension.—A student on probation who fails to raise his index to 2.00 within the time specified may be suspended. A student who fails one-half or more of the minimum of 16 semester hours may be suspended.

A student suspended for poor scholarship may, within ten days, appeal his case to the Committee on Scholarship through the Dean. If the case appears to be remediable and the student seems likely to improve in his scholarship, the Committee may readmit him on probation. A student denied readmission may again, after the lapse

of a calendar year, petition the Committee through the Dean for readmission. A student suspended twice will not be readmitted.

CURRICULUM REQUIREMENTS

In any of the following curricula at least 30 semester hours must consist of courses numbered above 100.

BACHELOR OF ARTS IN EDUCATION

The objective of programs leading to the degree of Bachelor of Arts in Education is to provide (1) general educational backgrounds; (2) functional command of ideas, concepts, knowledge, and skills in one or more teaching fields; (3) mastery of basic professional information and skills adequate for the beginning teacher; and (4) development of attitudes needed for success in teaching.

The general educational backgrounds needed by prospective teachers are obtained through: precollege education, college courses, work experience, leadership activities, student campus activities, and off-campus cultural opportunities.

Normally, from 60 to 64 semester hours of the total requirement are completed in the Junior College of this University or in an equivalent institution elsewhere. (See "Education," pages 53-54.) Since the teaching fields differ in content, scope, and complexity, some programs are longer than others. None requires less than 126 hours of satisfactory work, exclusive of required Physical Education. All candidates are required to take and make a satisfactory score on the common part of the National Teacher Examinations.

Teaching-field requirements include satisfactory completion of prescribed academic courses in at least one field, a satisfactory score on the special field examination of the National Teacher Examinations if available,* and satisfactory completion of the prescribed special methods courses. Programs of study are available in the following fields: art, biology, business education, chemistry, elementary education, English, French, general science, geography, German, history, home economics, mathematics, physical education, physics, Russian, social studies, Spanish, and speech. (See the School of Education separate catalogue for the prescribed courses in these fields.)

The student preparing to teach on the secondary level may be required to complete the prescribed courses in a minor as well as a major field. The student preparing to teach on the elementary level should use free electives within an academic field or area of specialization.

Professional Education

The basic professional information, skills, and attitudes needed by beginning teachers are provided through a sequence of courses to be taken in the junior and senior years. Lectures and class discussions are closely coordinated with field work. Courses are arranged to prepare for teaching on the various levels—elementary school, junior high school, senior high school, and adult.

PROFESSIONAL COURSES—SECONDARY

| | | |
|-------------------|--|------------------------|
| Education 109-10: | Human Development, Learning, and Teaching..... | Semester Hours 6 |
| Education 112: | Educational Measurement, or | |
| Statistics 104: | Statistics in Psychology and Education I..... | 3 |

* Special field examinations of the National Teacher Examinations are available in Elementary Education, English Language and Literature, Social Studies, Biological Science, Physical Science, Mathematics, French, Spanish, and Physical Education. Students preparing to teach in fields in which special NTE field examinations are not available (Art, Business Education, Chemistry, Geography, German, History, Home Economics, Physics, Russian, and Speech) must obtain a satisfactory score on a special field examination given by the instructor in the special methods course involved.

| | Semester Hours |
|---|-------------------|
| Education 121-22: Society and the School..... | 6 |
| Education 131: Common Teaching Skills in Secondary Schools..... | 3 |
| Education 134: Student Teaching in Secondary Schools..... | 6-9 |
| Three to six semester hours from the following Special Methods courses..... | 3-6 |
| Education 136: Teaching English | |
| Education 138: Teaching Social Studies | |
| Education 140: Teaching Mathematics | |
| Education 144: Teaching Science | |
| Education 146: Teaching Foreign Languages | |
| Education 148: Teaching Home Economics | |
| Education 150: Teaching Business Subjects | |
| Total..... | 27-33 |

PROFESSIONAL COURSES—ELEMENTARY

| | |
|--|-----------|
| Education 109-10: Human Development, Learning, and Teaching..... | 6 |
| Education 111: Methods in Elementary Education..... | 12 |
| Education 112: Educational Measurements, or | |
| Statistics 104: Statistics in Psychology and Education I..... | 3 |
| Education 121-22: Society and the School..... | 6 |
| Education 135: Student Teaching in Elementary Schools..... | 9 |
| Total..... | 36 |

BACHELOR OF SCIENCE IN HOME ECONOMICS

The curriculum leading to this degree is designed to prepare young women for the important responsibility of home-making. The program can be adapted, however, to meet special requirements in nutrition, dietetics, clothing, and other related fields. Each student must plan her work with the assistance of a faculty adviser in the Department of Home Economics.

General Home-Making

| JUNIOR YEAR | Semester Hours | SENIOR YEAR | Semester Hours |
|-------------------------|-------------------|----------------------------|-------------------|
| Home Economics 53..... | 3 | Home Economics 152..... | 3 |
| Home Economics 72..... | 3 | Home Economics 171..... | 3 |
| Home Economics 102..... | 3 | Home Economics 181..... | 3 |
| Home Economics 123..... | 3 | Home Economics 192..... | 3 |
| Physiology 115..... | 3 | Home Economics 197-98..... | 6 |
| Elective | 15 | Elective | 12 |
| Total..... | 30 | Total..... | 30 |

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION FOR MEN

There are three curricula leading to this degree*. The curriculum in Physical Education with an academic minor is designed to prepare students for teaching positions in smaller schools where it is necessary to teach an academic subject in addition to physical education. The Physical and Health Education curriculum prepares for the teaching of physical and health education in the larger schools. The curriculum in Physical Education and Recreation has been planned for those who wish to be prepared to direct programs of recreation in addition to the teaching of physical education.

* Candidates for the degree of Bachelor of Arts in Education may also prepare to teach Physical Education in secondary schools as a minor teaching field. Those preparing to teach in the elementary school may choose Physical Education as an area of specialization. For detailed requirements see School of Education separate catalogue.

The minimum requirements for this degree are 66 semester hours, distributed as follows:

Curriculum in Physical Education with an Academic Minor

| JUNIOR YEAR | Semester Hours | SENIOR YEAR | Semester Hours |
|--------------------------------|----------------|--------------------------------|----------------|
| Education 109-10..... | 6 | Education 131..... | 3 |
| Education 121-22..... | 6 | Education 134..... | 6-9 |
| Physical Education 105..... | 3 | Physical Education 103..... | 3 |
| Physical Education 107..... | 1 | Physical Education 115-16..... | 4 |
| Physical Education 113-14..... | 4 | Physical Education 131..... | 3 |
| Physical Education 121-22..... | 6 | Physical Education 138..... | 3 |
| Physiology 115..... | 3 | Academic teaching field..... | 6-11 |
| Academic teaching field..... | 4 | | |
| Total..... | 33 | Total..... | 33 |

Curriculum in Physical and Health Education

| JUNIOR YEAR | Semester Hours | SENIOR YEAR | Semester Hours |
|--------------------------------|----------------|--------------------------------|----------------|
| Education 109-10..... | 6 | Education 131..... | 3 |
| Education 121-22..... | 6 | Education 134..... | 6-9 |
| Physical Education 107..... | 1 | Physical Education 103..... | 3 |
| Physical Education 109-10..... | 4 | Physical Education 105..... | 3 |
| Physical Education 113-14..... | 4 | Physical Education 115-16..... | 4 |
| Physical Education 121-22..... | 6 | Physical Education 131..... | 3 |
| Physiology 115..... | 3 | Physical Education 138..... | 3 |
| Elective..... | 3 | Elective..... | 5-8 |
| Total..... | 33 | Total..... | 33 |

Curriculum in Physical Education and Recreation

| JUNIOR YEAR | Semester Hours | SENIOR YEAR | Semester Hours |
|--------------------------------|----------------|-----------------------------|----------------|
| Education 109..... | 3 | Education 131..... | 3 |
| Education 121-22..... | 6 | Education 134..... | 6-9 |
| Physical Education 48..... | 2 | Physical Education 103..... | 3 |
| Physical Education 107..... | 1 | Physical Education 122..... | 3 |
| Physical Education 109-10..... | 4 | Physical Education 131..... | 3 |
| Physical Education 113-14..... | 4 | Physical Education 138..... | 3 |
| Physical Education 121..... | 3 | Physical Education 161..... | 3 |
| Physical Education 132..... | 1 | Physical Education 162..... | 3-6 |
| Physical Education 151-52..... | 6 | Elective..... | 3 |
| Elective..... | 3 | | |
| Total..... | 33 | Total..... | 33 |

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION FOR WOMEN

The Physical Education major curriculum is designed to prepare students for teaching in elementary and secondary school programs of physical education.

Within this curriculum there is opportunity for specialization in dance, corrective physical education, health education, and recreation.

The student wishing to prepare to teach another subject in addition to physical education may do so by using her elective hours to work toward a minor teaching field. Relevant work completed in the Junior College may be counted.

| JUNIOR YEAR | Semester Hours | SENIOR YEAR | Semester Hours |
|-------------------------------|----------------|-----------------------------|----------------|
| Education 109-10..... | 6 | Education 131..... | 3 |
| Education 121-22..... | 6 | Education 134..... | 6-9 |
| Physical Education 105-6..... | 6 | Physical Education 101..... | 3 |

| | Semester Hours | | Semester Hours |
|---------------------------------------|-------------------|---------------------------------------|-------------------|
| Physical Education 111-12..... | 4 | Physical Education 103..... | 3 |
| Physical Education 117-18..... | 2 | Physical Education 107..... | 1 |
| Physical Education 122..... | 3 | Physical Education 113..... | 3 |
| Physical Education 132..... | 1 | Physical Education 131..... | 3 |
| Physiology 115..... | 3 | Physical Education 139..... | 3 |
| Elective or minor teaching field..... | 3 | Elective or minor teaching field..... | 4-7 |
| Total..... | 34 | Total..... | 32 |

THE DEGREE OF MASTER OF ARTS IN EDUCATION

The School of Education offers programs leading to the professional degree of Master of Arts in Education. Each program is planned to prepare the student for some particular type of educational service. From the various related departments of the University, the student and his adviser select courses to give the student an adequate background in the chosen field of service. The prospective high school or junior high school teacher will ordinarily include study in the subject which he is planning to teach as well as in professional education.

In addition to preparation for classroom teaching, graduate programs of study are available in the following fields: (1) adult education, (2) classroom teaching—to include strengthening mastery of teaching field, (3) comparative education, (4) curriculum, (5) elementary education, (6) employee training, (7) guidance, (8) history of education, (9) philosophy of education, (10) reading, (11) school administration—secondary or elementary school principalship, and (12) secondary education.

Programs of work for teachers-in-service are differentiated from those for students without teaching experience. Additional information concerning these programs may be obtained by writing to the Dean.

ADMISSION TO CANDIDACY

The requirements for admission to candidacy for the Master's degree are stated on page 16. Those wishing to prepare for careers in guidance or administration must have had at least two years of successful teaching experience. Candidates whose undergraduate preparation does not include equivalents of the basic requirements of the Bachelor of Arts degree in Education must make up deficiencies.

ADVANCED STANDING

For the record, advanced standing is granted for approved courses taken at other accredited institutions, but a minimum of 30 semester hours must be completed at this University as a matriculated candidate for the degree.

Advanced courses completed in this University in excess of the requirements for the Bachelor's degree may be credited toward the Master's degree to the extent of 12 semester hours, if the work fits in with the student's plan of specialization and is approved in writing by the Dean before being undertaken.

Advanced standing is not granted for work completed three or more years before application for admission or readmission to Master's candidacy.

REQUIREMENTS FOR THE DEGREE

PLAN OF STUDY

The plan of study leading to the degree of Master of Arts in Education requires a minimum of 33 hours of graduate credit. The plan may, at the student's option, include a thesis carrying 6 hours of graduate credit. Whether or not a student selects the thesis option, a minimum of 18 hours, including a course in educational

research methods and procedures, must be from courses planned primarily for graduate students (third group courses). A minimum of 12 hours, not including the thesis or the research course must be from courses offered by the Department of Education.

Programs may include additional teaching-field preparation. In such cases, however, undergraduate and graduate courses combined must be at least equivalent to the undergraduate requirements for the degree of Bachelor of Arts in Education (see pages 124 and 125).

Programs are planned initially in conference with an admissions adviser in the Office of the School of Education and subsequently with a designated adviser in the candidate's area of specialization.

All degree requirements must be completed within a period of six years after admission to study.

RESIDENCE

Candidates for the degree of Master of Arts in Education must complete satisfactorily at this University, as matriculated candidates in the School of Education, a minimum of 30 semester hours, 9 of which, with the approval of the adviser, may be in the Off-Campus Division of the College of General Studies.

THE THESIS

If a candidate selects the thesis option, the thesis must conform to standards prescribed. A statement of these standards may be obtained at the Office of the Dean.

The thesis subject must be approved in writing by the candidate's adviser and recorded in the Office of the Registrar by the date announced in the University calendar. The thesis in its final form must be presented to the Dean by the candidate no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis (see pages 44-45) are available in the Office of the Dean.

Payment of tuition for the thesis will entitle the candidate, during the academic year of registration, to the advice and direction of the member of the Faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period it must be registered for again and tuition paid on the same basis as for a repeated course.

COMPREHENSIVE EXAMINATION

In addition to the course examinations, the candidate must pass a comprehensive examination in two parts: (1) a general three-hour examination concerned with an integrated understanding of the foundations of professional education, and (2) a special three-hour examination concerned with the candidate's area of specialization. For additional information, see the separate catalogue of the School of Education.

FIVE-YEAR PROGRAM

A candidate entering the School of Education from the Junior College (or with equivalent preparation) may choose a three-year program leading to the degrees of Bachelor of Arts and Master of Arts in Education to be conferred simultaneously. The first year of this combined program will be devoted to teaching-field preparation; the work of the second year will include the Bachelor of Arts junior-year pro-

fessional courses and a maximum of 18 semester hours of graduate courses; that of the third and final year, senior-year undergraduate professional courses and the remaining graduate courses needed for the Master's degree. Student Teaching, to be elected in the third year, may not be taken for graduate credit. A quality-point index of at least 2.50 in undergraduate courses must be attained before beginning the work of the senior year and the program must meet all the requirements for the degrees of Bachelor of Arts and Master of Arts in Education.

THE ADVANCED PROFESSIONAL CERTIFICATE

This program is designed to prepare teachers and administrators for more effective service in their chosen fields and to enable them to qualify for a higher step in the local salary scale.

The program of studies leading to the Certificate is selected by the candidate and his adviser from the various related departments of the University in accordance with the student's needs. In general it includes 30 hours of graduate credit beyond the Master's degree. The candidate wishing to increase his teaching proficiency may include additional study in his teaching field. For information concerning available programs, see the separate catalogue of the School of Education.

ADMISSION TO CANDIDACY

The requirements for admission to candidacy for the Advanced Professional Certificate are stated on pages 16-17. The applicant who is unable to meet the admission requirements may be admitted with deficiencies to be met by satisfactorily completing prerequisites in addition to the specified program of graduate study. Each applicant must be interviewed by a member of the Faculty of the School of Education.

ADVANCED STANDING AND TRANSFER OF CREDIT

Advanced standing is granted for appropriate graduate work completed in other accredited higher institutions. However, a minimum of 18 semester hours must be completed at this University as a matriculated candidate in the School of Education. The candidate is encouraged to include in his program study at other accredited higher institutions when such study seems to be in his best interest. Advanced standing is not granted for work completed three or more years before application for admission or readmission.

REQUIREMENTS FOR THE CERTIFICATE

Plans of Study

In planning his program the candidate should give first consideration to his particular needs. If he is a teacher and his study for the Master's degree was largely in professional education, he may need courses in his teaching field. If his Master's preparation was in a content field, he may need professional study. Those in administration and related services may wish to continue specialization on a more advanced level.

The program must include, in addition to any prerequisites, a minimum of 30 hours of graduate credit, 24 hours of which must be in third-group courses (or the equivalent at other institutions). A maximum of 6 semester hours of graduate credit in second-group courses may be included, a minimum of 12 hours in courses offered by the School of Education must be included.

Residence

Candidates for the Advanced Professional Certificate must complete satisfactorily at this University a minimum of 18 semester hours in courses offered on the campus. The balance of the program may include courses in the Off-Campus Division of the College of General Studies or in other approved institutions of higher learning. The candidate is not required to pursue his program of study continuously. On request, a leave of absence is granted for a period not to exceed three years.

THE DEGREE OF DOCTOR OF EDUCATION

The School of Education offers programs of advanced study leading to the degree of Doctor of Education. These programs are under the supervision of the Committee on Graduate Studies and provide opportunities for study leading to the following professional objectives: school superintendent, secondary school principal, elementary school principal, supervisor, director of guidance, director of curriculum development, professor of education, and specialist in educational research, employee training, or adult education. All programs require study of interrelated areas of education as well as a doctoral dissertation in the major field of study.

Each program is divided into two parts. The first consists of preparation for and the passing of comprehensive examinations in each of four supporting fields and a major field of study. The second is composed of research investigation and the writing of a dissertation in the major field of interest and culminates in the final oral examination.

Detailed information on programs is provided in a separate publication obtainable on request.

ADMISSION

The applicant must possess adequate preparation for advanced study including graduate work in fields prerequisite to his objective equivalent to that required for the degree of Master of Arts in Education at The George Washington University, at least three years of successful pertinent educational experience, acceptable personal qualities, and a capacity for creative scholarship and effective leadership.

The applicant first arranges for a preliminary interview with the Assistant Dean for Advanced Graduate Studies to explore his needs in relation to the resources of the School of Education and, if possible, to provide the guidance needed to proceed with an application for advanced study.

To be admitted to graduate study for the degree, the applicant must be accepted by the Committee on Graduate Studies on the basis of the following factors: (1) his previous scholastic and professional record; (2) the results of prescribed admission tests; (3) individual evaluation through personal conferences with at least three faculty members including the major professor under whom the applicant desires to pursue his work; and (4) the outcome of a group interview with the Committee on Graduate Studies.

The responsibility for selection of supporting and major fields rests with the candidate. Each applicant when he appears before the Committee on Graduate Studies should be prepared to present an outline of his plan of study including the selection of major and supporting fields and the tools of investigation needed for the completion of a doctoral dissertation. The tools may include one foreign language or more, statistical methods, or historical criticism. Candidates with less preparation than that normally required for a Bachelor's and Master's degree in Education must make up their deficiencies either prerequisite to or as part of their graduate work.

STUDY FOR THE MAJOR AND SUPPORTING FIELD EXAMINATIONS

The requirements for the degree of Doctor of Education cannot be stated in semester hours, but they consist in general of at least two to three years of full-time work beyond the degree of Master of Arts in Education or the equivalent. Upon admission to study for the first part of a doctoral program the applicant is assigned to a Committee which prescribes and directs his studies. The Committee is composed of professors who will direct the student's work in the major and four supporting fields. Preparation for and the passing of supporting field examinations precedes preparation for and taking the final examination in the major field.

A student is required to consult individually with supporting and major field professors in order to determine the requirements for each field of study and to receive guidance in preparation for each examination. Supporting field examinations are written and are six hours in length. The major field examination is twelve hours in length, six hours on each of two successive days. Upon satisfactory completion of all supporting and major field examinations the student, upon recommendation of the Committee on Graduate Studies, is permitted to pursue the second part of his doctoral program.

THE DISSERTATION AND THE FINAL EXAMINATION

The student permitted to continue the second part of a doctoral program is assigned to a Master in Research, generally the major field adviser. Throughout the remainder of the program, the candidate is responsible solely to his Master in Research. Two additional faculty members assist the Master in reading the first draft of the candidate's dissertation. When the dissertation is considered acceptable, the Master recommends the candidate to the Dean for the final oral examination.

The final oral examination must be passed at least three weeks before the degree is to be conferred. The examination is conducted by a committee of the Faculty appointed by the Dean, supplemented by at least two leaders in the candidate's field of study from outside the University. The examination is open to the public. Candidates who successfully pass the oral examination are recommended for the degree by the Faculty of the School of Education.

RESIDENCE AND CONTINUOUS STUDY

All the preparation for the degree must be done in residence. The student must maintain continuous registration in the School of Education, except when the Committee on Graduate Studies has granted a leave of absence. Failure to maintain registration in each semester of the academic year may result in lapse of candidacy. Subsequent readmission is subject to whatever new conditions and regulations have been established by the Committee on Graduate Studies.

There is no formal regulation concerning the minimum amount of time to be spent in preparation for the minor and supporting field examinations or as a candidate engaged in doctoral research. The supporting and major field examinations, however, must be completed within five years of the date of admission and the entire program must be completed within eight years, regardless of full-time or part-time study. Each candidate is required to complete one semester or more of his program in full-time study. Full-time study in two nine-week Summer Sessions is equivalent to full-time study for one semester.

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS

THE FACULTY AND STAFF OF INSTRUCTION*

A. M. Woodruff, *Dean*

Professors J. W. Brewer, H. F. Bright, D. S. Brown, A. E. Burns, R. D. Campbell, R. H. Davison, J. C. Dockeray, Mitchell Dreese, R. B. Eastin, R. F. Ericson, D. C. Faith, C. E. Galbreath, H. L. Geisert†, F. H. Gibbs, Wood Gray, T. W. Holland, Thelma Hunt, G. C. Jacobus, J. L. Jessup, A. R. Johnson, A. D. H. Kaplan, E. L. Kayser, J. W. Kendrick, R. D. Kennedy, W. H. Kraus, W. K. Legner, Edwin Lewis (*Visiting*), G. L. Lippitt, H. M. Merriman‡, W. E. Schmidt†, D. S. Watson, W. R. West, A. M. Woodruff

Professorial Lecturers S. N. Alexander, Charles Berns, F. C. Brimacombe, J. L. Buckler, C. W. Clewlow, Gerhard Colm, F. V. Demaret, Ezra Glaser, L. W. Hamilton, Hans Heymann, Jr., Frank Higginbotham, C. E. Houston, H. F. Hubbard, J. L. Krieger, Solomon Kullback, V. L. Lewis, K. F. McClure, Edward McCrensky, C. A. McLaughlin, M. E. Ogdon, W. J. Peebles, F. M. Riddick, F. I. Shaffner, C. L. Simpson, I. E. Steele, J. N. Stonesifer, K. E. Stromsem, W. G. Torpey, Daniel Wit, W. H. Wriggins, R. A. Young

Associate Professors John Clayton, W. C. Davis, R. C. Haskett§, F. C. Kurtz, H. L. LeBlanc, J. N. Mosé, Benjamin Nimer, Leonard Prestwich, J. W. Skinner, Waldo Sommers, R. B. Thompson, H. W. Westermann, Helen Yakobson

Associate Professorial Lecturers H. M. Bain, R. C. Bain, L. C. Collins, O. C. Disler, W. W. Edwards, Seymour Geisser, L. I. Gintzig, Samuel Greenhouse, W. D. Johnson, R. S. Jorden, Robert Kaye, R. A. Kinney, F. K. McTyier, J. P. Murphy, John Provan, J. R. Snitzler, William Spencer, C. P. Wolle

Assistant Professors H. R. Ludden, E. E. Pontius, Jr.

Lecturers R. J. Bond, J. F. Doubleday, J. P. Fitz-Patrick, D. K. Good, George Idelson, W. L. Jabonek, W. D. Johnson, Morton Kupperman, R. A. Lucas, J. A. Morrow, W. D. Neighbors, H. R. Page, Ross Pollock, C. H. Slayman, T. W. Stanley, A. C. Stedry

Instructor R. E. Thomas

COMMITTEES¶

COMMITTEE ON ORGANIZATION AND POLICY

H. F. Bright, R. B. Eastin, F. H. Gibbs, A. R. Johnson, R. D. Kennedy, W. H. Kraus, H. L. LeBlanc, H. M. Merriman, W. E. Schmidt, Waldo Sommers

COMMITTEE ON ADMISSION AND ADVANCED STANDING

Waldo Sommers (*Chairman*), J. W. Brewer, R. B. Eastin, H. M. Merriman

COMMITTEE ON CURRICULUM AND PROGRAMS

J. W. Brewer (*Chairman*), J. C. Dockeray, A. R. Johnson, E. H. Johnson, R. D. Kennedy, D. S. Watson

* The president of the University, the Dean of Faculties, the Dean of the School, the Registrar of the University, the Director of Admissions of the University, Professors, Associate Professors, Assistant Professors, and Instructors constitute the Faculty.

† This listing of Faculty and Staff of Instruction is for the academic year 1960-61.

‡ On leave of absence fall semester 1960-61.

§ On sabbatical leave fall semester 1960-61.

¶ The Dean of the School of Government, Business, and International Affairs is a member ex officio of all committees.

COMMITTEE ON DOCTORAL STUDIES

E. H. Johnson (*Chairman*), J. C. Dockeray, R. B. Eastin, R. D. Kennedy, D. S. Watson

EXECUTIVE COMMITTEE, BUREAU OF BUSINESS AND ECONOMIC RESEARCH

J. C. Dockeray (*Chairman*), E. H. Johnson, R. D. Kennedy, D. S. Watson

GENERAL INFORMATION

INTRODUCTORY

The School of Government, Business, and International Affairs offers undergraduate and graduate work in two groups of integrated programs: public and international affairs and the theory and administration of government and business.

The purpose of the School is to give the student an understanding of his responsibilities under the Constitution of the United States in the conduct of public office, domestic and foreign, and also to prepare students for careers in governmental service and in related business and professional fields.

REGULATIONS

Students in the School of Government, Business, and International Affairs are subject to and are expected to familiarize themselves with, the regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 9-23, and the University regulations stated on pages 40-46.

AMOUNT OF WORK

A full-time student not on probation may not ordinarily take more than 15 semester hours. A student employed more than 24 hours a week, who is not on probation, may not take more than 9 semester hours.

A full-time student whose quality-point index is 3.50 or higher may take not more than 18 semester hours. A student employed more than 24 hours a week, whose index is 3.50 or higher, may take up to 12 semester hours.

A student who accepts employment after registration or at any time during a semester must report immediately to the Dean, so that his program may be adjusted if necessary.

Exception to these rules will require the approval of the Dean.

ATTENDANCE

The student is held responsible for all the work of the courses in which he is registered, and all absences must be excused by the instructor in charge before provision is made for him to make up the work missed.

INDEPENDENT STUDY PLAN

A student of *demonstrated capacity*, with a special interest in the subject matter of a course, may be permitted to undertake study under the personal direction of an instructor, in accordance with the rules of the appropriate department. Credit under this plan is limited to the specific course credits normally allowed when taken on a class basis.

THE BACHELOR'S DEGREES

The School offers programs leading to (1) the degrees of Bachelor of Arts in Government with majors in International Affairs or Public Affairs and (2) the de-

gree of Bachelor of Business Administration with majors in Accounting, Business Administration, and Business and Economic Statistics.

REQUIREMENTS FOR THE DEGREES

SCHOLARSHIP

The system of grading and of computing scholarship is described in detail on pages 40 and 41.

In order to graduate, a student must have the following: (1) a general quality-point index of at least 2.00 and (2) an index in his major of at least 2.50. The major includes the required courses and courses taken in the group options.

Dean's Honor List.—The names of students who achieve a quality-point index of 3.50 or higher are placed on the Dean's Honor List for that semester. Appearance on the List will be limited to (1) full-time students registered for a minimum of 12 semester hours and (2) part-time students registered for a minimum of 12 semester hours over a period of two consecutive semesters, which may include the summer term.

Probation.—A student must maintain a quality-point index of at least 2.00, or be placed on probation, where he remains as long as his index is below 2.00.

Suspension.—A student whose index is 1.50 or who is placed on probation for a third semester, whether successive or after an interval, is suspended.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. He must then submit evidence to the Committee on Admission and Advanced Standing that during his absence from the University, he has so conducted himself as to indicate that he will profit by readmission. A student suspended twice for poor scholarship will not be readmitted.

EXAMINATIONS FOR WAIVING CURRICULUM REQUIREMENTS

A required course may be waived by the satisfactory passing of a waiver examination authorized and prescribed by the department or curriculum adviser concerned. Passing this examination does not entitle the student to any hours of credit toward the degree. Request to take the examination should be made to the curriculum adviser and the required fee paid at the Office of the Cashier before the date specified in the University calendar.

GRADUATE RECORD EXAMINATIONS

During the final semester of the senior year students are required to take the following Graduate Record Examinations: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and Area Tests (achievement), which measure breadth of knowledge and understanding in three broad areas of the liberal arts: Natural Science, Social Science, and the Humanities. (For further information concerning the Graduate Record Examinations, see page 44.)

RESIDENCE

For residence requirements, see the University regulations on pages 43 and 44.

CURRICULUM REQUIREMENTS

To be recommended by the Faculty for graduation, candidates are required to complete, in addition to the appropriate freshman and sophomore work, a minimum

of 60 semester hours during the junior and senior college years, as set forth in one of the following curricula.

BACHELOR OF ARTS IN GOVERNMENT

INTERNATIONAL AFFAIRS

The international affairs program is broad, covering international political relations, international trade and finance, international communications, and regional studies. Its purpose is to equip students, by providing general background and specialized work, for careers in the field of American foreign relations. The diplomatic service of the United States, the several agencies of government with responsibilities in the international field, the international organizations, and American enterprise abroad offer opportunities in this field.

| | Semester Hours |
|---|-------------------|
| Econ. 181-82 International Economics | 6 |
| Hist. 181-82 Diplomatic History of the United States..... | 6 |
| Pol. Sc. 171..... International Politics | |
| or Hist. 150..... European Diplomatic History since 1878..... | 3 |
| Pol. Sc. 172..... International Organization: the United Nations..... | 3 |
| Pol. Sc. 181-82..... International Law | 6 |
| Pol. Sc. 197..... Proseminar in International Affairs..... | 3 |
| Foreign Language Composition and Conversation..... | 6 |
| Geography | 3 |
| Group Option (To be selected from one of the following groups in consulta- tion with adviser)..... | 15 |
| Electives | 9 |
| Total..... | 60 |

All international affairs majors must complete the *required* courses listed above, plus the group option. Group option courses must be selected after consultation with the adviser. Normally no more than 6 semester hours may be taken in an option other than the one selected. Consent of the adviser must be obtained for such modification of the option selected.

Group I—International Politics

Composed of courses in Political Science, History, and Geography concerned with the study of American diplomatic relations.

Group II—International Economic Relations

Composed of courses in Economics and Business and Public Administration concerned with the study of American economic, financial, and business relationships with foreign countries.

Group III—International Communications

Composed of courses in Political Science, Psychology, Sociology and Anthropology, and Journalism concerned with the study of international information programs, public opinion, psychological warfare, cultural relations, and public relations. (It is recommended that the student include statistics in his Junior College program.)

Group IV—Area or Regional Studies

Composed of courses in Economics, History, Political Science, and Geography. Integrated programs of study are available in the following regions or areas: Europe, Africa, and the Middle East, Asia and the Pacific Area, the Soviet Orbit, and Latin America. Modifications and combinations of these areas may be made if approved by the adviser. The foreign language requirement should be met by a language suitable for study of the region or area selected.

PUBLIC AFFAIRS

The Public Affairs program is a broad, composite curriculum dealing with domestic government and policy.

| | Semester Hours |
|--|-------------------|
| Econ 121 Money and Banking..... | 3 |
| Econ. 161-62 Public Finance and Taxation..... | 6 |
| Econ. 165 Government Control of Economic Activity..... | 3 |

| | Semester Hours |
|---|-------------------|
| Hist. 172 Social History of the United States since 1861 | |
| or Hist. 173 Representative Americans | |
| or Hist. 176 Political and Constitutional History of the United States since 1861 | 3 |
| Pol. Sc. 121-22 The Constitution of the United States | 6 |
| Pol. Sc. 145 Political Parties and Politics | 3 |
| Pol. Sc. 151-52 Public Administration | 6 |
| Group Option (To be selected from one of the following groups in consultation with adviser) | 15 |
| Electives | 15 |
| Total | 60 |

All public affairs majors must complete the *required* courses listed above. The group options provide specializations. Modifications and substitutions may be made when appropriate or necessary provided the consent of the adviser is obtained.

| | Semester Hours |
|--|-------------------|
| Group I—Economics Option | |
| Econ. 101 Economic Analysis | 3 |
| Econ. 105 Business Cycles | 3 |
| Econ. 141 Industrial Relations | 3 |
| Econ. 142 Labor Economics | 3 |
| Hist. 174 Economic History of the United States | 3 |
| Total | 15 |
| Group II—Politics Option | |
| Hist. 175-76 Political and Constitutional History of the United States | 6 |
| Pol. Sc. 111 Introduction to Comparative Government | 3 |
| Pol. Sc. 118 Political Theory: the Growth of Political Thought in the West | 3 |
| or Pol. Sc. 120 Foundations of American Democracy | 3 |
| Pol. Sc. 146 Political Pressures and Public Reactions | 3 |
| or Psych. 156 Psychology of Propaganda and Public Opinion | 3 |
| Total | 15 |

BACHELOR OF BUSINESS ADMINISTRATION

The programs in business administration, accounting, and business and economic statistics stress breadth of preparation for eventual senior administrative responsibilities. Approximately two-thirds of each program is in liberal arts subjects.

ACCOUNTING

In accounting, the emphasis is on the managerial approach. At the same time the foundation is laid for a later professional career in the field with the C.P.A. designation. Many students qualify for this designation within a few months after graduation. The accounting curriculum provides considerable material in governmental accounting and controllership. The program requires 39 hours of substantive courses, plus 15 hours of option, plus 6 hours of electives, which normally are advanced courses in liberal arts subjects.

| | Semester Hours |
|--|-------------------|
| Acct. 101 Cost Accounting | 3 |
| Acct. 111 Financial Statement Analysis | 3 |
| Acct. 121-22 Intermediate Accounting | 6 |
| Acct. 132 Accounting Theory | 3 |
| Acct. 161 Income Tax Accounting | 3 |
| Acct. 171 Auditing | 3 |
| Acct. 181 Accounting Systems | 3 |
| Bus. Adm. 102 Fundamentals of Management | 3 |
| Bus. Adm. 131 Business Finance | 3 |

| | Semester Hours |
|--|-------------------|
| Bus. Adm. 161 Commercial Law: Contracts, Sales, Agency, and Bailments... | 3 |
| Bus. Adm. 162 Commercial Law: Negotiable Instruments, Property, Mort- gages | 3 |
| Econ. 121 Money and Banking..... | 3 |
| | 39 |
| Group Option (to be selected from one of the following groups) | 15 |
| Electives (to be selected in consultation with the adviser) | 6 |
| Total..... | 60 |

All accounting majors must complete the *required* courses listed above, plus the group option. Group option courses must be selected after consultation with the adviser.

Group I—Public Accounting

Composed of courses in Accounting and Business and Public Administration.

Group II—Commercial and Industrial Accounting

Composed of courses in Accounting, Business and Public Administration, Economics, and Statistics.

Group III—Governmental Accounting and Budgeting.

Composed of courses in Accounting, Business and Public Administration, Political Science, and Economics.

BUSINESS ADMINISTRATION

The program in business administration is designed to provide the broad foundation required for eventual top leadership in either governmental or business administration. Thirty semester hours of substantive courses are required. In addition students take 15 semester hours in one of the group options and 15 hours of electives, which normally are advanced courses in liberal arts subjects.

| | Semester Hours |
|---|-------------------|
| Bus. Adm. 101..... Introduction to Business..... | 3 |
| Bus. Adm. 102..... Fundamentals of Management..... | 3 |
| Bus. Adm. 105..... Personnel Management | 3 |
| Bus. Adm. 131..... Business Finance | 3 |
| Bus. Adm. 141..... Principles of Marketing..... | 3 |
| Bus. Adm. 161..... Commercial Law: Contracts, Sales, Agency, and Bailments.... | 3 |
| Bus. Adm. 162..... Commercial Law: Negotiable Instruments, Property, Mort- gages | 3 |
| Bus. Adm. 198..... Case Problems in Management..... | 3 |
| Acct. 193 Business Budgeting | 3 |
| Econ. 121 Money and Banking..... | 3 |
| | 30 |
| Group Option (to be selected from one of the following groups) | 15 |
| Electives (to be selected in consultation with the adviser) | 15 |
| Total..... | 60 |

All business administration majors must complete the *required* courses listed above, plus the group option. Selection of group option courses must be made in consultation with the adviser. Normally no more than 6 semester hours may be taken in an option other than the one selected. Consent of the adviser must be obtained if the student wishes such modification of his option group.

Group I—General Business

Composed of courses in Accounting, Business and Public Administration, Economics, and Statistics.

Group II—Personnel Management

Composed of courses in Business and Public Administration, Economics, Psychology, Speech, and Statistics.

THE THESIS

The student who plans to complete work for a Master's degree in one year should register for the thesis at the beginning of the year; otherwise he should be registered for it not later than the beginning of the final year. The choice of the thesis subject must be approved by the professor in charge and recorded in the Office of the Registrar by the date announced in the University calendar. The thesis in its final form must have the approval of the professor in charge and must be presented to the Dean by the student no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis (see pages 44-45) are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the Faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year is granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period, the student must reregister and pay tuition as for a repeated course.

MASTER OF ARTS IN GOVERNMENT

Curricula leading to the degree of Master of Arts in Government are available in the fields of International Affairs, Public Affairs, Public Administration, Personnel Administration, and Economic Policy, as described below.

The field of Personnel Administration, including options in Counseling and Psychometrics, is described on pages 144-45 and may lead to either the degree of Master of Arts in Government or the degree of Master of Business Administration.

INTERNATIONAL AFFAIRS

Prerequisite: an undergraduate major in international affairs, economics, history, or political science, depending upon the field of specialization. Any course deficiency in the stated group of required courses of the undergraduate curriculum (except foreign language) must be made up.

The program in International Affairs is offered in four fields of specialization: International Economics, International Politics, International Communications, and Regional Studies.

International Economics.—Graduate courses in economics (numbered over 200) in the field of international trade, the balance of payments, international financial policies, and international economic policies form the principal part of this specialization. Graduate courses in economic theory are recommended. Other courses may be included with the consent of the adviser.

International Politics.—Graduate courses in political science and history (numbered over 200), in international law, international politics, international organization, diplomatic history, and American foreign policy, comprise the principal requirements for this specialization. Related courses may be added with the consent of the adviser.

International Communications.—Graduate courses (numbered over 200) in political science, psychology, sociology and anthropology, and geography with 12 hours (one-half of the course work) in the fields of public opinion, international information, psychological warfare, and communications, and 12 hours (one-half of the course work) in the fields of international politics and area studies. The adviser in all cases must approve the course selections.

Regional Studies.—Graduate courses in economics, political science, history, and geography (numbered over 200) dealing with a geographic region, such as Latin America, Europe, Africa, and the Middle East, Asia, the Soviet Orbit, or the Pacific Area, comprise the principal requirements. Other courses of broader scope in economics, history, and political science are recommended as part of the program. The adviser in all cases must approve such selections.

The listing of graduate courses for these fields of specialization is given in the departmental offerings for Economics, History, Political Science, Geography, Psychology, and Sociology and Anthropology.

PUBLIC AFFAIRS

Prerequisite: an undergraduate major in public affairs, economics, history, or political science, depending upon the field of specialization. Any course deficiency in the Public Affairs Curriculum, as stated on pages 135-36 must be made up.

The program in Public Affairs is offered in two fields of specialization: Domestic Economics and Domestic Politics.

Recommended for Domestic Economics: courses in economic development, economic policy, public finance, and national income.

Recommended for Domestic Politics: courses in United States social, constitutional, and political history; comparative government; political theory; legislative organization; jurisprudence; political parties; and public opinion.

PUBLIC ADMINISTRATION

The purpose of the program in Public Administration is to prepare graduates to enter public service in the field of administration and to improve the competence of those already in public employment. The program assumes that effective performance at all levels of administration calls for an understanding of the human factors involved, a knowledge of the nature and institutional characteristics of administration in the public service, and an ability to apply the methods and techniques of management. An understanding of all three elements is provided by bringing together into the program different disciplines, including courses in political science, business and public administration, psychology, economics, accounting, and statistics.

Prerequisite: an undergraduate background in the social sciences or business administration.

The candidate for the degree must successfully complete a minimum of 30 hours at the graduate level. This will include 6 hours of thesis. Of the remaining 24 semester hours, students must select at least 6 hours from each of the three groups indicated below, and such other courses as are necessary to complete the program. Selection of all courses by the student must have the approval of the adviser.

Group I. Human Factors in Administration

| | Semester Hours |
|---|-------------------|
| Bus. Adm. 288.....Executive Leadership | 3 |
| Psych. 228.....Seminar: Techniques of Counseling..... | 3 |
| Pub. Adm. 231.....Public Personnel Management..... | 3 |
| Pub. Adm. 232.....Personnel Procedures and Problems..... | 3 |
| Pub. Adm. 233.....Seminar in Manpower Development and Utilization.... | 3 |
| Pub. Adm. 237.....Intermediate Management and Supervision..... | 3 |
| Pub. Adm. 241.....Human Relations in Governmental Administration... | 3 |
| Pub. Adm. 242.....Communications and Executive Action..... | 3 |
| Pub. Adm. 272.....Reading and Conference Course in Public Personnel Administration | 3 |

Group II. Methods and Tools of Management

| | |
|---|---|
| Acct. 141.....Governmental Accounting..... | 3 |
| Acct. 246.....Governmental Accounting and Budgeting Problems.... | 3 |
| Bus. Adm. 109.....Office Management..... | 3 |
| Bus. Adm. 268.....Management Engineering..... | 3 |
| Psych. 255.....Seminar: Techniques of Opinion and Attitude Meas- urement | 3 |
| Pub. Adm. 213.....Administration in Government..... | 3 |
| Pub. Adm. 215.....Seminar in Comparative Administrative Systems..... | 3 |
| Pub. Adm. 216.....Management Analysis and Methods Improvement.... | 3 |
| Pub. Adm. 217.....New Tools of Management..... | 3 |
| Pub. Adm. 221-22...Staff Functions in Government..... | 6 |
| Pub. Adm. 254.....Controllorship in the Federal Services..... | 3 |

| | Semester Hours |
|--|-------------------|
| Pub. Adm. 259.....Government Procurement and Property Management.. | 3 |
| Stat. 109.....Managerial Statistics..... | 3 |
| Group III. Program Management and Policy Direction | |
| Bus. Adm. 102.....Fundamentals of Management..... | 3 |
| Bus. Adm. 286.....Management in the Armed Forces..... | 3 |
| Econ. 261-62.....Public Finance and Fiscal Policy..... | 6 |
| Econ. 266.....Theory of Economic Policy..... | 3 |
| Pub. Adm. 210.....The Management Function..... | 3 |
| Pub. Adm. 211.....Problems of Governmental Organization..... | 3 |
| Pub. Adm. 212.....Case Studies in Administration..... | 3 |
| Pub. Adm. 225-26...Internship in the Administrative Processes..... | 6 |
| Pub. Adm. 251.....Governmental Budgeting | 3 |
| Pub. Adm. 252.....Seminar in Planning and Programming..... | 3 |
| Pub. Adm. 260.....Seminar in Policy Formulation and Administration.... | 3 |
| Pub. Adm. 261.....Public Opinion and the Administrator..... | 3 |
| Pub. Adm. 262.....Contemporary Administrative Theory and Practice..... | 3 |
| Pub. Adm. 271.....Reading and Conference Course in Public Management and Administration | 3 |

ECONOMIC POLICY

Prerequisite: an undergraduate major in economics or the equivalent.

The 30 hours of required work must include Economics 210, 265-66; and the thesis, Economics 299-300.

Recommended: courses in income and employment, national income, business cycles, monetary and fiscal policy, economic theory, and statistics. These courses and others that may be appropriate are to be selected with the consent of the adviser.

MASTER OF BUSINESS ADMINISTRATION

Curricula leading to the degree of Master of Business Administration are available in the fields of Accounting, Business and Economic Statistics, General Business Administration, Hospital Administration, and Personnel Administration, as described below.

The field of Personnel Administration, including options in Counseling and Psychometrics, is described on pages 144-45 and may lead to either the degree of Master of Arts in Government or the degree of Master of Business Administration.

ACCOUNTING

Prerequisite: an undergraduate major in accounting or the equivalent. The program in Accounting requires the following courses:

| | Semester Hours |
|---|-------------------|
| Acct. 231.....Contemporary Accounting Theory..... | 3 |
| Acct. 295-96.....Seminar in Accounting..... | 6 |
| Acct. 299-300.....Thesis | 6 |

Of the remaining 15 semester hours, 9 must be in accounting and 6 in related fields selected with the approval of the adviser.

BUSINESS AND ECONOMIC STATISTICS

Prerequisite: an undergraduate major in Business and Economic Statistics, or the equivalent; such work must include a minimum of 24 semester hours of second group courses in statistics and a minimum of 10 semester hours in second-group courses in accounting, business administration, and economics.

This program requires at least 12 semester hours of graduate courses in statistics. The remaining 12 semester hours are to be selected from graduate work offered by the departments of accounting, business and public administration, economics, and statistics with the approval of the adviser.

GENERAL BUSINESS ADMINISTRATION

This curriculum provides the graduate student with instruction which will help him advance to responsible positions in business. The program is also valuable for many positions in government, particularly those in "business-type" operations.

The Master of Business Administration program is sufficiently flexible to meet the basic requirements of any vocational objective requiring a knowledge of management principles. While most students in this program will normally take Business Administration 201, *Advanced Management*, and Business Administration 291-92, *Seminar in Business Management*, and other courses in Business Administration, the individual program should be planned with an adviser so as to include graduate courses offered by other departments wherever appropriate. Particular attention should be given the offerings under Public Administration, Economics, Accounting, Statistics, and Psychology.

The degree of Master of Business Administration is granted upon successful completion of a minimum of 24 hours of graduate courses and 6 hours of *Thesis*. Individual programs are planned in consultation with an adviser. Students who do not present satisfactory undergraduate majors will be required to take background courses, which will be selected in accordance with individual qualification and work experience.

The thesis subject should be selected as early as possible so as to permit effective integration with the course work.

HOSPITAL ADMINISTRATION

The purpose of this program is to give students an opportunity to acquire the knowledge, attitudes, and skills which will provide a foundation for their growth into capable administrators of hospitals and related institutions.

Work for the degree is divided into two phases. During the first phase a minimum of semester hours of academic courses, selected in accordance with each student's background and needs, must be completed. These courses cover the general and technical background of hospital administration, general administrative theory and practice, and problem solving in the area of management as it relates to hospitals.

The second phase includes the hospital training and the written report, in the form of a thesis, on a research project assigned at the beginning of the phase. By special permission, additional research and course work may be substituted for a part of the clinical training. Each program is planned for the individual student in accordance with his experience, needs, and aim.

Full-time students ordinarily should complete both phases for the degree in twenty-one months; *part-time students* in thirty-six months. Under special circumstances, additional time may be authorized.

Prerequisite: a Bachelor's degree from an accredited college or university, with a *B* average in the undergraduate major. Consideration is given in the selection of candidates to personal qualifications, aptitude for hospital administration, and practical experience.

The program requires a minimum of 45 hours of graduate courses; twenty-one months of residence, including a calendar year of hospital training under qualified supervision; and a research report. The following courses are required:

| | Semester Hours |
|---|-------------------|
| *Bus. Adm. 201.....Advanced Management | 3 |
| *Bus. Adm. 268.....Management Engineering | 3 |
| Hosp. Adm. 202.....Introduction to Medical Care Administration..... | 3 |

* Students with credit for this course may substitute an approved graduate course.

| | Semester Hours |
|---|-------------------|
| Hosp. Adm. 203-4...Hospital Administration I-II..... | 6 |
| Hosp. Adm. 205-6...Studies in Hospital Management I-II..... | 6 |
| Hosp. Adm. 207...Hospital Management Methods..... | 3 |
| *Hosp. Adm. 296-97- 98.....Hospital Residency | 9 |

The remaining 12 hours are elective, with the approval of the adviser.

PERSONNEL ADMINISTRATION

This program, including options in Counseling and Psychometrics, instructs students in underlying principles and techniques. The program leads to the degree of Master of Arts in Government if elective courses are directed toward Public Administration. It can also lead to the degree of Master of Business Administration if elective emphasis is directed toward Business Administration. Courses are to be selected from the following, with the approval of the adviser.

| | Semester Hours |
|---|-------------------|
| Bus. Adm. 209.....Seminar in Personnel Management..... | 3 |
| Bus. Adm. 210.....The Personnel Manager..... | 3 |
| Bus. Adm. 291-92.....Seminar in Business Management..... | 6 |
| Econ. 241.....Labor Economics | 3 |
| Econ. 244.....Collective Bargaining | 3 |
| Psych. 227.....Seminar: Counseling and Guidance..... | 3 |
| Psych. 244.....Seminar: Job Analysis and Evaluation..... | 3 |
| Psych. 245.....Seminar: Employee Motivation and Morale..... | 3 |
| Psych. 246.....Seminar: Personnel Measurement Techniques..... | 3 |
| Pub. Adm. 210.....The Management Function..... | 3 |
| Pub. Adm. 231.....Public Personnel Management..... | 3 |
| Pub. Adm. 232.....Personnel Procedures and Problems..... | 3 |
| Pub. Adm. 233.....Seminar in Manpower Development and Utilization.... | 3 |
| Pub. Adm. 241.....Human Relations in Governmental Administration.... | 3 |
| Pub. Adm. 272.....Reading and Conference Course in Public Personnel Administration | 3 |

Counseling Option

Prerequisite: an undergraduate major in psychology, business administration, or education; or an undergraduate major in the social sciences appropriate to specialization in this field. The undergraduate background should include necessary basic training in such fields as psychology, sociology, statistics, labor economics, and business management or public administration.

The Master of Arts program in Counseling requires the following courses:

| | Semester Hours |
|--|-------------------|
| Psych. 220.....Seminar: Abnormal Psychology | |
| or | |
| Psych. 225.....Seminar: Mental Hygiene..... | 3 |
| Psych. 227.....Seminar: Counseling and Guidance..... | 3 |
| Psych. 228.....Seminar: Techniques of Counseling..... | 3 |
| Psych. 229.....Seminar: Occupational and Educational Information .. | 3 |
| Psych. 236.....Seminar: Analysis of the Individual for purposes of Counseling | 3 |
| Psych. 299-300.....Thesis | 6 |

The remaining 9 hours are elective, with the approval of the adviser.

Psychometrics Option

Prerequisite: an undergraduate major in psychology, statistics, or the social sciences which includes twelve credits in psychology (general psychology, tests and measurements).

* The student must register for 9 semester hours of residency at the end of the first phase and before he leaves the University for his residency hospital. Registration for 1962-63 will be held May 25, 1962.

personnel psychology, and related psychology courses); general statistics; mathematics through college algebra (preferably through calculus).

The Master of Arts program in Psychometrics requires the following courses:

| | Semester Hours |
|---|-------------------|
| Psych. 231.....Test Construction | 3 |
| Psych. 234.....Seminar: Test Theory..... | 3 |
| Psych. 246.....Seminar: Personnel Measurement Techniques..... | 3 |
| Psych. 299-300.....Thesis | 6 |
| Stat. 105.....Statistics in Psychology and Education II..... | 3 |
| Stat. 117.....Analysis of Variance I..... | 3 |
| Stat. 118.....Correlation and the Chi-square Test I..... | 3 |

The remaining 6 hours are elective, with the approval of the adviser.

DOCTOR OF BUSINESS ADMINISTRATION

The work for this degree is under the supervision of the Committee on Doctoral Studies of the School of Government, Business, and International Affairs.

An applicant must have the degree of Master of Business Administration, Master of Arts in an approved field, or the equivalent of such degrees, together with acceptable personal qualities and a capacity for creative scholarship. Each applicant must demonstrate his competence in Statistics and Accounting by qualifying examinations.

After admitting an applicant, the Committee on Doctoral Studies, in consultation with the applicant, will designate six fields of study and appoint an adviser to guide the student in his work in these fields. As part of this work, the student must complete a minimum of 30 semester hours in graduate courses. Additional course work may be prescribed by the adviser.

When the applicant has satisfied his adviser and the Committee of his readiness to take the General Examination, this Examination will be scheduled.

The General Examination is a written comprehensive on fields of study not limited to the subject matter of courses taken in these fields. Two fields of study are required of all applicants: Economic Theory and Business and Economic History. The four additional fields, selected by the Committee and the applicant, will be drawn from the following list: Marketing, Organization and Management, Business Finance and Investments, Personnel Management, Public Administration, Accounting Theory, Money and Banking, Statistics, Transportation and Traffic Management, and such others as the Committee may designate.

Upon successful completion of the General Examination and approval of the subject of the doctoral dissertation, the student may be admitted to candidacy by the Committee on Doctoral Studies. The candidate's research and the preparation of his dissertation are supervised by a Research Adviser designated by the Committee.

THE DISSERTATION

No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation together with a fourth copy of the summary and a copy of the abstract for inclusion in the announcement of the examination. It is the responsibility of the candidate for a Doctoral degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the dissertation, which are rigidly enforced. The summaries of accepted dissertations will be printed in a numbered issue of the University BULLETIN.

The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

THE FINAL EXAMINATION

The Final Examination of the candidate consists of his oral defense of the dissertation. The examination will be given by a committee appointed by the Committee on Doctoral Studies. Upon successful completion of this oral examination the candidate will be approved for the degree of Doctor of Business Administration by the Committee on Doctoral Studies.

SPECIAL PROGRAMS

The Government Management Intern Scholarship Program offers annually fifty scholarships to assist federal agencies in training carefully selected young men and women for administrative leadership in government career service. Each scholarship provides a tuition-free course of 3 hours a semester and appropriate academic credit (up to 6 semester hours) for the successful completion of training assignments required in any agency which has been evaluated by the University.

The Navy Graduate Comptrollership Program, sponsored by the Naval Post Graduate School, provides 50 semester hours of work in comptrollership and related fields for a selected group of Naval and Marine officers. The Master's degree is awarded upon successful completion of this full-year program.

The Air Force Advanced Management Program, sponsored by the United States Air Force Institute of Technology, provides 50 semester hours of work in advanced management and supporting fields for a selected group of Air Force officers. Most of the officers receive the Master's degree upon successful completion of this full-year program.

The School of Government, Business, and International Affairs cooperates with the College of General Studies in the Off-Campus program of that College, particularly in the fields of accounting, business administration, controllership, governmental administration, international affairs, and personnel administration. Special Master's degree programs have been established by the College of General Studies in cooperation with the School of Government, Business, and International Affairs for the students and faculty of the Army War College, Carlisle Barracks, Pennsylvania; the Industrial College of the Armed Forces, Fort McNair, Washington, D. C.; and the National War College, Fort McNair, Washington, D. C. These programs lead to the degrees of Master of Arts in International Affairs and Master of Business Administration.

The Department of Business and Public Administration offers work in the field of property and casualty insurance as part of the educational program of the American Institute for Property and Liability Underwriters, Inc.

BUREAU OF BUSINESS AND ECONOMIC RESEARCH

The Bureau, as part of the School of Government, Business, and International Affairs, was established to conduct research in both the fields of business and economics. This work is under the direction of the Executive Committee of the Bureau of Business and Economic Research. Research projects are also sponsored by public and private agencies. Both faculty and students of the School participate in the activities of the Bureau. Results of research activities as well as abstracts of selected Masters' theses are reproduced and disseminated by the Bureau.

CENTER FOR THE BEHAVIORAL SCIENCES

The Center, administratively related to the School of Government, Business, and International Affairs was established as an inter-departmental and inter-disciplinary Center for encouraging behavioral science research, projects and programs, educational and instructional activities, and consulting services to the metropolitan area of Washington, D. C. Projects are sponsored and financed by foundations, governmental agencies, private organizations, and individual gifts. This work is under the direction of Dr. Gordon L. Lippitt, Professor of Behavioral Sciences. A Faculty Executive Committee gives University supervision, while a nation-wide Advisory Board provides policy recommendations for long-range planning. An inter-University Research Advisory Committee reviews proposals and projects. Faculty members and students participate in the activities of the Center for the Behavioral Sciences. Results of research studies and relative projects are reported through a publication program of the Center.

THE COLLEGE OF GENERAL STUDIES*

G. L. Angel, *Dean*; W. H. Hayes, Jr., *Assistant Dean*; R. W. Eller, *Director, Campus Division*; J. A. Timour, *Director, Off-Campus Division*; Mary Coleman, *Director, Reading Clinic*; C. E. Galbreath, *Director, Off-Campus Center, Army War College, Carlisle Barracks, Pa.*

COMMITTEES†

THE DEAN'S COUNCIL‡

1961: A. R. Johnson, B. S. Root; 1962: D. C. Faith, B. D. Van Evera; 1963: R. H. Moore, C. H. Walther

COMMITTEE ON UNDERGRADUATE ADMISSION AND ADVANCED STANDING

G. L. Angel (*Chairman*), R. J. Alexander, J. C. Dockeray, J. W. Harkness, L. P. Leggette, J. L. Metivier, Jr., J. Y. Ruth (*ex officio*)

COMMITTEE ON GRADUATE STUDIES

G. L. Angel (*Chairman*), J. W. Brewer, J. C. Dockeray, J. L. Jessup, A. R. Johnson, Waldo Sommers, J. Y. Ruth (*ex officio*)

COMMITTEE ON SCHOLARSHIP

W. H. Hayes, Jr. (*Chairman*), H. G. Detwiler, R. B. Eastin, Florence Mears, F. R. Houser (*ex officio*)

COMMITTEE ON CURRICULUM AND PROGRAMS

B. D. Van Evera (*Chairman*), J. H. Coberly, R. W. Stephens

* This listing of Administrative Officers is for 1960-61.

† The Dean and Assistant Dean are members *ex officio* of all committees.

‡ The Dean of Faculties, the Dean and Assistant Dean in the College are members *ex officio* of the Council.

GENERAL INFORMATION

The College of General Studies was established in 1950. The objectives of the College are to extend the adult education facilities of the University; to introduce experimental procedures in conducting programs of study for mature students; and to provide auxiliary courses not included in formal programs of study, in response to community interest. The college includes the Off-Campus Division, the Campus Division, and the Division of Community Services.

OFF-CAMPUS DIVISION

The Off-Campus Division works closely with personnel administrators, training officers, school officials, and others interested in developing programs of in-service training or off-duty education for employees in departments of the Federal Government, business, and industry; for people working in the fields of education; and for service personnel in nearby military installations. Credit and noncredit courses are organized in any liberal arts field in which there is sufficient demand and for which instructional facilities can be made available. These courses meet at the time and place most convenient for the students enrolled and may begin at any time of the year. In cooperation with Channel 9, WTOP-TV, credit and noncredit television courses and noncredit radio courses are offered.

Credit courses may be applied toward a degree in any college or school of the University provided (1) the student is accepted for degree candidacy in that school or college; (2) the courses meet the curriculum requirements of the school or college; and (3) the number of semester hours earned in the College of General Studies does not exceed the maximum allowed in transfer by the school or college concerned. Credit courses may be transferred to other colleges and universities.

ADMISSION TO COURSE WORK

Admission to an off-campus course does not constitute admission to degree candidacy or permission to attend classes on campus.

A simplified procedure for admission and registration in off-campus courses is conducted at or prior to the first meeting of the class. Transcripts of previous academic work are not required. Registration in credit courses is restricted to those whose qualifications indicate that they are able to complete the course successfully. Degree students enrolled in any other college, school, or division of the University may take credit courses in the College of General Studies *only by permission of the dean* of the college, school, or division concerned. In general, off-campus noncredit courses are open to any individual interested in enrolling. However, when a course is organized at the request of some particular agency or group, admission may be restricted to the students recommended by the sponsoring organization. A limit on the size of classes may have to be imposed in order to maintain the quality of instruction.

ADMISSION TO DEGREE CANDIDACY

Application for degree candidacy should be made only if there is a reasonable assurance that the student will be in the area long enough to complete the requirements. Credits granted by this College for the General Educational Development tests and for service schools and correspondence courses may or may not be accepted by another institution or by other schools and colleges of this University.

The following factors are considered in determining the eligibility of an applicant:

1. The adequacy of previous academic work as preparation for the course of study contemplated, including quantity and quality of work and the standing of the institution in which it was done.

2. Results of specified tests, when prescribed by the Committee on Undergraduate Admission and Advanced Standing.

3. The aptitude of the student for the curriculum contemplated.

4. The character of the student.

In agencies and service installations where there is sufficient enrollment to permit offering the necessary range of courses, it is possible, without campus study, to earn the following degrees: Associate in Arts, Associate in Science, Associate in Secretarial Administration, Bachelor of Arts, Bachelor of Science in Cartography, and Master of Arts in the fields of Controllershship, Governmental Administration, and Personnel Management.

Special Master's degree programs have been established by the College of General Studies in cooperation with the School of Government, Business, and International Affairs for the students and faculty of the Army War College, Carlisle Barracks, Pennsylvania; the Industrial College of the Armed Forces, Fort McNair, Washington, D. C.; and the National War College, Fort McNair, Washington, D. C. These programs lead to the degrees of Master of Arts in International Affairs and Master of Business Administration.

CAMPUS DIVISION

The Campus Division is designed for promising adults with unusual backgrounds who merit the individual consideration made possible by this Division's experimental approach to admission, advanced standing, curricula, and evaluation of achievement. The criteria of eligibility for admission are stringent in order to limit registration to (1) adults well qualified to undertake college work but lacking certain academic requirements for admission to other degree-granting schools and colleges of the University and (2) adults who, through work experience, have gained broad knowledge and high competency in some area of learning. This knowledge may be validated by special examination to gain advanced standing toward a degree.

REQUIREMENTS FOR ADMISSION

The applicant must meet the following requirements:

1. He must be an adult who has achieved outstanding success in his vocation.

2. He must have completed, with the grade of at least C +, 12 semester hours in the Off-Campus Division, the Division of University Students, or the Division of Special Students. The student who has completed a substantial amount of college work elsewhere with excellent grades may apply for admission to degree candidacy after 6 semester hours at The George Washington University.

3. He must present valid reasons for selecting degree candidacy in the Campus Division of the College of General Studies rather than in another school or college of the University.

4. He must enroll for at least two courses a semester on Campus. Full-time study is encouraged.

DEGREES

The Campus Division offers programs leading to the degrees of Associate in Arts and Bachelor of Arts. In cooperation with Columbian College, the School of Education, and the School of Government, the Campus Division makes available programs leading to the degree of Bachelor of Arts, with majors in the liberal arts and

sciences, and in various subject-matter fields in education and government. Students selecting these majors must satisfy the prerequisite course requirements prior to admission to candidacy or take them as additional work after being admitted.

ARMED FORCES SECTION

The Armed Forces Section of the Campus Division was established for those service personnel who wish to study full time at the University and who have only a limited time under military orders in which to complete their programs of study. Such students register for campus courses through the College of General Studies and remain under its administrative and academic control. By permission of the Dean they may enroll in appropriate courses in the Off-Campus Division.

Military and naval personnel are eligible for admission to this section of the Campus Division if they meet the following requirements:

1. The applicant must be in attendance under official orders which give him a specified time to finish his degree requirements.
2. He must prove that the degree requirements can be completed in the time specified in his orders only by taking advantage of the advanced standing provisions of this College.
3. He must be in a position to enroll for full-time study.

By special arrangements with the Department of the Navy, a naval section of the Armed Forces Section has been established. Such personnel attend the University as full-time students, ordinarily for five semesters.

PROVISIONS FOR SPECIAL PROGRAMS

The Air Force Advanced Management Program sponsored by the United States Air Force Institute of Technology, provides 50 semester hours of work in advanced management and supporting fields through the educational facilities of the School of Government for a selected group of Air Force officers. Those who qualify by a combination of academic background and the satisfactory completion of this program can be awarded a Bachelor's degree by the College of General Studies. Those with Bachelor's degrees can take these courses for graduate credit to be applied toward the degree of Master of Arts in the field of Governmental Administration.

Alumni of the Army War College, the Industrial College of the Armed Forces, and the National War College who were unable to complete the requirements for the degrees of Master of Arts in International Affairs and Master of Business Administration while stationed at these military installations may enroll in the Armed Forces Section to complete the requirements for these degrees.

REGULATIONS

Students in the Campus Division of the College of General Studies are subject to and are expected to familiarize themselves with the regulations of the University as stated on pages 9-23 and 40-46, as modified in the separate catalogue of the College of General Studies.

DIVISION OF COMMUNITY SERVICES

This Division was organized to provide needed auxiliary educational services and to promote programs designed to supplement the formal educational offerings of the University.

Noncredit courses in a wide variety of subject fields are set up at the request of any interested group. There are no entrance requirements. The length of each

course is determined by the wishes of the sponsoring group and the nature of the subject to be studied.

The George Washington University Reading Clinic offers both diagnostic and corrective work for small groups or individuals and reading improvement techniques for small classes. All courses are designed to meet particular individual needs whether on a remedial basis or for accelerated reading comprehension. (See page 159.)

FEES

The tuition fees for off-campus credit courses and campus courses are stated in the College of General Studies separate catalogue. The tuition fees for noncredit courses are determined by the length and nature of the course.

Fees for noncredit courses and eight-week credit courses are payable in full at the first meeting of the course. By special arrangement, payment for fifteen-week credit courses may be made in three equal installments.

For complete information concerning the College of General Studies, see the separate catalogue which is available upon request to the College of General Studies, 706 Twentieth Street NW.

THE DIVISION OF UNIVERSITY STUDENTS*

E. L. Kayser, *Dean*; J. G. Allee, Jr.†, *Associate Dean*

THE DEAN'S COUNCIL‡

I. B. Hansen, F. E. Johnston, R. D. Kennedy

GENERAL INFORMATION

INTRODUCTORY

The Division of University Students was established in 1930. In this Division are registered mature students who wish to undertake university courses for credit either here or elsewhere or as auditors, but who are not at this time working toward degrees in this University.

REGULATIONS

Students in the Division of University Students are subject to, and are expected to familiarize themselves with, the regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 9-23; the University regulations stated on pages 40-46; and the regulations concerning PROBATION AND SUSPENSION which are the same as those stated on page 50 under the Junior College.

TRANSFER TO REGULAR STATUS

A "University student" may be transferred, at his request, to another college or school of the University only upon complying with the regulations of the specific

* This listing of Administrative Officers is for 1960-61.

† On sabbatical leave summer 1961.

‡ The Dean of Faculties, the Dean and the Associate Dean of the Division are members ex officio of the Council.

college or school to which he wishes to transfer. The student should familiarize himself with the regulations printed in the University CATALOGUE concerning admission, residence, amount and quality of work. He should also specifically note the University regulations regarding transfers within the University on page 42 and regarding graduation requirements on pages 43-45, and observe that when a student transfers into a degree-granting school or college, to be eligible for a degree he must meet not only all the general graduation requirements, but also such special requirements as may apply in his particular curriculum.

THE DIVISION OF SPECIAL STUDENTS

W. R. West, *Dean*

THE DEAN'S COUNCIL*

Thelma Hunt, A. C. Murdaugh, F. S. Tupper

GENERAL INFORMATION

INTRODUCTORY

The Division of Special Students was organized in 1944. To this Division may be admitted students who are in the process of qualifying for degree candidacy. Students in this Division are designated "special students".

REGULATIONS

Students in the Division of Special Students are subject to, and are expected to familiarize themselves with, the regulations concerning ADMISSION, REGISTRATION, FEES AND FINANCES stated on pages 9-23; and the University regulations stated on pages 40-46.

SCHOLARSHIP

A student in this Division may be dropped for reasons of scholarship if his quality-point index falls below 2.00.

The system of grading and computing scholarship is described in detail on pages 40 and 41.

ACADEMIC SCHEDULE

The schedule of the "special student" is made up of courses required in the curriculum to which he wishes to transfer. The choice of courses must be approved by the Dean. If the student has not completed the language requirements of this curriculum at the time of his admission to the University, he must include three hours of language in each twelve hours of work until this requirement is met. Second- or third-group courses may not be taken unless all first-group requirements have been met or are being met concurrently.

Credits earned at other institutions are evaluated at the time of admission to this Division. They are withheld until the "special student" transfers to a degree-granting college or school, when those appropriate to his curriculum are applied toward advanced standing.

In each individual case, the schedule will be reduced when it is deemed advisable.

* The Dean of Faculties and the Dean of the Division are members *ex officio* of the Council.

TRANSFER TO REGULAR STATUS

A "special student" may transfer to a degree-granting college or school of the University when he has satisfactorily completed his program in the Division of Special Students and has met the admission requirements of the college or school to which he wishes to transfer. The student should familiarize himself with regulations printed in the University CATALOGUE concerning admission, residence, amount and quality of work. He should also specifically note the University regulations regarding transfer within the University on page 42 and regarding graduation requirements on pages 43-45, and observe that when a student transfers into a degree-granting school or college, to be eligible for a degree he must meet not only all the general graduation requirements, but also such special requirements as may apply in his particular curriculum.

ADVISORY SYSTEM

Students in the Division of Special Students are expected to consult with an adviser in the Office of the Dean at least once each semester. Any student who has a question in regard to his status, or whose grades are below C, or who is in academic difficulty, is urged to make an appointment promptly without waiting for a request from the Dean.

DIVISION OF AIR SCIENCE

E. M. Wall, *Director*

MILITARY SERVICE DELAY AND AIR FORCE ROTC ADVANCED COURSE SELECTION BOARD*

J. L. Gagnier (*Chairman*), G. M. Koehl, C. D. Linton, T. G. Martin, M. A. Mason, L. M. Garrell (*Recorder*)

GENERAL INFORMATION

INTRODUCTORY

The Air Force Reserve Officers Training Corps (Air Force ROTC) unit was established at the University in 1951 under authority of Section 40-47C, National Defense Act of June 3, 1916, as amended. Air Force personnel, approved by the President of the University, are assigned by the Department of the Air Force to supervise and conduct the Air Force ROTC program.

The mission of the Air Force ROTC is to develop in selected students through classroom instruction and leadership training, the qualities essential for advancement to responsible positions as commissioned officers in the United States Air Force.

COURSE OF STUDY

The program is divided into the basic course covering the first two years and the advanced course covering the junior year, summer training unit, and senior year.

Since many of the academic subjects in which college students are enrolled have a direct relationship to military as well as to civilian careers, some of the liberal arts courses of the University have been substituted for academic courses included

* The President of the University, the Dean of Faculties, and the Director of the Division are members ex officio of this Board.
Selection Board is for the academic year 1960-61.

in standard Air Force ROTC curricula. Courses have been carefully selected to avoid duplication in instruction and to provide practical training in organization, leadership, and discipline, which will be of value in industrial or professional careers. The duties and responsibilities of commissioned officers, oral or written expression, and the techniques of problem solving are emphasized throughout the course, both in theory and practice. In addition, orientation flights and field trips to Air Force bases are available to cadets on a voluntary basis.

Twelve semester hours of elective credit* are granted Air Science students as follows:

Freshman year: fall semester, 1 hour; spring semester, 3 hours

Sophomore year: fall semester, 3 hours; spring semester, 1 hour

Junior and senior years: each semester, 1 hour

In the four-year program 16 semester hours of credit for courses offered by other colleges and schools of the University may be substituted for Air Science courses. For a description of Air Science courses, see the Department of Air Science under "Courses of Instruction."

Cadets in the advanced course receive subsistence allowances from the Government totaling approximately \$500, which is exempt from income tax. During the period of summer training, cadets receive \$75 a month, food, lodging, and travel expense. Uniforms, textbooks, and training materials are provided for all Air Science courses at no expense to the cadet.

ELIGIBILITY REQUIREMENTS

Enrollment in the Division of Air Science basic course is open to all men students who are at least 14 years of age, physically fit, of good character, and candidates for a Bachelor's degree. Men enrolling in the basic course are required to complete successfully the two-year course as a prerequisite to graduation from the University. Upon successful completion of the basic course, a cadet may apply for enrollment in the advanced course.

Women students may enroll in the Basic Leadership Laboratory course, which satisfies the physical education requirement. They may also enroll in the academic portion of the basic course for elective credit, with the approval of the Director of Air Science and the dean concerned.

A cadet enrolled in the advanced course must successfully complete the junior- and senior-year Air Science curricula and summer training unit as a prerequisite to graduation. Upon graduation he is obligated to accept a commission in the United States Air Force, if tendered. Any cadet who for academic, physical, or other reasons becomes disqualified for a commission is relieved of this obligation. Cadets preparing for pilot training may be required to take 35 hours of flying instruction. This instruction is provided by a Civil Aeronautics Administration approved school at government expense, and leads to qualification for a private pilot's certificate.

Both men and women may enroll in Advanced Air Science courses with the approval of the Director of Air Science and the dean concerned.

MILITARY SERVICE DELAY

Deferment from induction under the Selective Service Act of 1951 may be granted to selected cadets within authorized quotas. Normally, a cadet is not considered for draft deferment until he has completed one semester's work in the University.

* The amount of elective credit applicable toward a degree varies with the curriculum concerned.

with a quality-point index of at least 2.00. A cadet's deferment is subject to withdrawal if his index falls below 2.00.

STUDENT HONORARY MILITARY SOCIETIES

The Arnold Air Society.—A national honorary military society of qualified Air Force ROTC cadets established to further the mission, traditions, and concept of the United States Air Force as a means of national defense, to promote American citizenship, and to create a close and more rewarding relationship among the Air Force ROTC cadets. The national organization founded in 1947, was named in honor of the late General of the Air Force Henry Harley Arnold. The local squadron established in 1952, was named in honor of General Carl Spaatz (retired), the first Chief of Staff of the United States Air Force. All Air Force ROTC cadets who meet the established qualifications are eligible for election to membership. Members are authorized to wear a blue and gold auguilette and ribbon on their cadet uniforms.

Pershing Rifles.—A national honorary military society founded in 1894 by Lieutenant (later General of the Armies) John Joseph Pershing. Its purpose is to encourage, preserve, and develop the highest ideals of the military profession, promote American citizenship, create a closer and more efficient relationship, and provide appropriate recognition of a high degree of cadet achievement. Only basic ROTC cadets are eligible for election to membership. Members are authorized to wear a blue and silver cord and ribbon on their cadet uniforms.

WOMEN'S ACTIVITIES

Flying Sponsors.—A local women's honorary organization established in 1952 to sponsor Air Force ROTC activities.

Angel Flight.—For women who wish to participate with the men in the Leadership Laboratory. Attractive uniforms are supplied free of charge.

REGULATIONS

Cadets and students in the Division of Air Science are subject to and are expected to familiarize themselves with the University regulations stated on pages 9-23 and 40-46; the regulations of the college, school, or division in which enrolled; and the regulations of the United States Air Force pertaining to Air Force ROTC cadets. Individual copies of Cadet Regulations are issued upon enrollment.

THE SUMMER SESSIONS

C. W. Cole, Dean

THE DEAN'S COUNCIL*

Wood Gray, I. B. Hansen

During the summer of 1961 the University offers an eight-week session for undergraduate and graduate students in the Arts and Sciences. The Law School offers work in two six-week sessions. The School of Education offers (1) a twelve-week session composed of three-week daytime courses and six-week evening courses,

* The Deans of Faculties and the Dean of the Summer Sessions are members ex officio of the Council.

(2) a nine-week session composed of three blocks of three-week daytime and evening courses, and (3) a six-week daytime and evening session.

During the summer of 1961, courses are offered in the Junior College; Columbian College (the senior college); the Law School; the School of Pharmacy; the School of Education; the School of Government, Business, and International Affairs; and the College of General Studies.

For a complete statement concerning summer-term work, see the Summer Sessions catalogue.

Administrative Units

HEALTH ADMINISTRATION*

University Physicians R. B. Castell (*Director*), H. L. Pugh; *University Surgeon* B. F. Dean, Jr.; *Associate University Physicians* Alfred Brigulio, Margaret Callan, R. A. Cox (*Eye*), R. F. Dyer, R. H. Harmon, H. O. House (*Nose and Throat*); *Associate University Surgeon* J. B. Harrell; *Nurse* Mary Dugan

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary school;† (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.‡ All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of

* The listing of Administrative Officers is for 1960-61.

† A charge for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for this purpose.

‡ See Rule (5) for exception.

Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the physical education departments.

VETERANS EDUCATION

D. C. Faith, Director

The George Washington University is approved to provide training for those who are eligible under the provisions of Public Laws 346, 16, 550, 894, and 634. The Office of Veterans Education, Building Q, 2029 H Street, NW., operates as a service bureau for such persons interested in studying at the University and acts in a liaison capacity between the University and the Veterans Administration.

Eligible persons are advised to consult this Office concerning the procedure for securing educational benefits before applying to the Veterans Administration for certification. The Veterans Administration is on Constitution Avenue at Twentieth Street NW., Washington 25, D.C.

PUBLIC LAW 634

(War Orphans' Educational Assistance Act)

A child of a person who died of a disease or injury incurred or aggravated while on active duty in the Armed Forces during World War I, World War II, or the Korean Conflict may be eligible for educational assistance under this Act, if certain age requirements are met. In the case of a child who has not reached the age of majority, his guardian must make application for him to the Veterans Administration.

PUBLIC LAW 190

(World War II GI Bill Extension)

The educational benefits for World War II veterans terminated July 25, 1956, except that persons enlisting or reenlisting in the Armed Forces between October 6, 1945, and October 5, 1946, may count the entire period of such enlistment or reenlistment as war service for purposes of GI Bill benefits. Such enlistees have four years from the date that enlistment ended to begin training and nine years from that separation date to complete training under this provision.

PUBLIC LAW 550

(Korean GI Bill)

To be eligible under this Law, a veteran must have been in service between June 27, 1950 and January 31, 1955, and must no longer be on active duty.

At least thirty days prior to registration the veteran should apply to the Veterans Administration for a Certificate for Education and Training, for presentation

to the University Office of Veterans Education at the time of registration. A photostatic copy of his DD214 must accompany the original application for certification.

PUBLIC LAWS 16 AND 894
(Vocational Rehabilitation)

Disabled veterans desiring vocational rehabilitation under either Law should apply to the Veterans Administration for approval of their training objectives at least sixty days prior to registration.

SERVICE SCHOOL CREDITS

A limited amount of credit earned in service schools since 1941 may be considered for assignment to qualified degree candidates in the Junior College, Columbian College, the School of Engineering, and the School of Government. Veterans should submit to the Director of Admissions photostatic copies of their service school records, indicating courses successfully completed with sufficient identification of the course to locate it in the Guide to Evaluation of Educational Experience in the Armed Forces.

COMMUNITY AND UNIVERSITY SERVICES

THE READING CLINIC

Mary Coleman, *Director*

The Reading Clinic, 2018 I Street NW., offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition special reading improvement classes are conducted on the high school and adult level.

A complete diagnosis includes psychological tests; vision, hearing, and dominance tests; and the various reading and spelling tests. Results are interpreted and a written report is presented in conference with the parents or the individual.

The special reading classes for high school students and adults are offered throughout the year at stated intervals. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Machines such as the tachistoscope, rate accelerator, and controlled reader are also used for increasing speed of comprehension.

Fees.—The fee for individual diagnosis is \$35; for individual instruction, \$4.50 a lesson; for semi-individual instruction, \$3.50 a lesson; for instruction in small groups with common reading difficulties, \$2.75 a lesson; for materials, \$4. All fees are payable in advance at the Office of the Cashier.

THE SPEECH CLINIC

C. W. Pettit, *Director*

The Speech Clinic, Lisner Auditorium, 730 Twenty-first Street NW., offers diagnostic and corrective work for children and adults with such speech difficulties as

stuttering, lisping, cleft palate, cerebral palsy, asphasia, foreign accent, voice, and articulatory problems.

Fees.—There is no charge for the diagnosis. The fee for individual instruction is \$7 an hour; for group instruction, \$4 an hour. Fees are payable at the Office of the Cashier.

THE TESTING AND COUNSELING CENTER

Helen Stone, Acting Director

The Testing and Counseling Center, 718 Twenty-first Street NW., offers services which are available to students enrolled in the University, to high school students, and to adults of the community.

The services are designed to assist individuals in the evaluation of their educational and vocational potentialities and objectives, diagnose academic difficulties, provide educational and vocational literature and information, and refer individuals to qualified agencies for assistance with problems not handled by the Center.

Fees.—Except for specialized testing, the fee covers testing and counseling based on the results of the tests. For students who are currently registered as degree candidates in the University and for students in the Division of Special Students who are in the process of qualifying for degree candidacy, the fee is \$7.50; for students currently enrolled in the University but not as degree candidates, the fee is \$30; for graduates of The George Washington University, \$30; for community clients under twenty-one years of age, \$35; for community clients twenty-one or over, \$45. Fees for specialized testing are dependent upon the services involved. All fees are payable in advance at the Office of the Center.

Student Life

STUDENT LIFE

LIVING ACCOMMODATIONS

The University maintains five residence halls. Meals are served at the Student Union.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance. Forms for application, together with detailed information, may be obtained from the Director of Activities for Women, Woodhull House, 2033 G Street NW. or the Director of Activities for Men, Building Q, 2029 H Street NW.

Information concerning private rooming and boarding facilities near the University may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls (except freshmen) under the age of twenty-one, who are enrolled for twelve or more semester hours of academic work at the University and who are not living with their parents or relatives, may live outside the dormitory only with the permission and approval of the Director of Activities for Women, and upon receipt of written requests from parents. In no case will permission be granted for such girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Freshman girls may be domiciled outside the dormitory only with their parents or with immediate relatives with the written approval of their parents.

Women Students.—The Hattie M. Strong Hall provides single rooms at \$47.50 a month and double rooms at \$40 a month a person.

Dolly Madison Hall provides double rooms at \$40 a month a person.

Hancock Hall provides single rooms at \$52.50 a month and double rooms at \$40 a month a person.

Men Students.—Welling Hall provides double rooms at \$30 a month a person.

John Quincy Adams Hall provides 69 double rooms each with study alcove and bath. Rooms rent at \$40 a month a person.

Dormitory payments are due and payable in advance on the first day of each month. A student who fails to meet payments when due, but who makes his payment from the tenth to the fifteenth, inclusive, of the month in which payment is due, is charged a service fee of \$2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued rent and a reinstatement fee of \$5.

STUDENT UNION

The Student Union, 2125 G Street NW., is the center for student life. From the cafeteria on the first floor to the reading room on the fourth floor, it is well planned to meet the students' need for meals, study, recreation, and activities. In addition to the recreation lounge and social lounge the Student Union provides office space for the Student Council and for the other major student organizations.

The Student Activities Office, also in the Student Union, has available information concerning the student organizations and campus events.

HEALTH SERVICES

For details see "Health Administration", pages 156-57.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the various religious organizations of their own choice. Catholic, Jewish, and Protestant bodies sponsor these groups and form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

UNIVERSITY CHAPEL

The University Chapel is maintained as a nonsectarian service of worship for the University community. The service is held Wednesday of each week from 12:10 to 12:30 o'clock at 1906 H Street NW. Among the guest speakers are representative clergymen of Washington. The Director of Chapel is available for counseling and conference.

THE PLACEMENT OFFICE

The Placement Office, 2114 G Street NW., provides assistance to students and alumni seeking full-time, part-time, temporary, or permanent employment. The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration. The Office administers the On-Campus Industrial and Government Recruitment Interview Program for seniors and graduate students, in which well over 150 private companies, as well as certain government agencies, participate. This program offers outstanding employment opportunities to persons seeking careers.

Students and alumni interested in placement are asked to register in person at the Office and to select from written descriptions of current openings positions for which they wish referral. Those interested in planning careers are invited to study the information on career fields and the brochures of business and industrial organizations, government agencies, etc., which are on display in advance of campus visits by recruiting offices. The services of the Counseling Center (see page 159) are available to students and alumni wishing career guidance.

The Placement Office is open from 9:00 A.M. to 5:00 P.M., Monday through Friday.

INTERNATIONAL HOUSE

International House, 2110 G Street NW., is the social center for students from foreign countries. A series of teas, dances, and other forms of entertainment, and the use of club rooms and lounge enable students to become acquainted and feel at home in the University.

The International Students' Society welcomes as members students from other lands as well as North American students.

The Adviser to Students from Foreign Countries, whose office is in International House, is available for advice and guidance.

STUDENT ACTIVITIES

The University offers a comprehensive program of Student Activities planned to provide a variety of social and recreational experiences which complement the academic offerings.

DIRECTORS OF STUDENT ACTIVITIES

The University maintains the offices of the Director of Activities for Men and the Director of Activities for Women, for the guidance of students in all nonacademic

phases of student life, such as student activities, social life, and housing. The directors are available for individual counseling concerning personal adjustment to university life.

STUDENT GOVERNMENT

Student Council

The University believes in encouraging the development of a sense of civic responsibility in its students by delegating to them such authority in student activities as is consistent with established policy and regulations. To this end, the organization of the University includes the Student Council, which, under the guidance of the Directors of Student Activities, is responsible for the conduct of all student activities. The Student Council is elected annually by the student body.

Committee on Student Life

The Committee on Student Life is the judicial branch of the student government. It is composed of not more than seven members of the faculty, two of whom are the Director of Activities for Men and the Director of Activities for Women, appointed by the President of the University, and the following members: President of the Student Council, an Editor of the *Hatchet*, President of Mortar Board, President of Omicron Delta Kappa, President of the Interfraternity Council, and President of Panhellenic Council. This Committee has the power to review the acts of all student organizations, including the Student Council, and set aside acts that are contrary to established policy and regulations of the University or the Committee.

Approval of Student Organizations.—This Committee is granted authority to approve or disapprove the establishment of any proposed organization on campus. No student club or society (except social fraternities, sororities, scholastic honor societies, religious or professional clubs or societies) organized as a branch or affiliate of a non-George Washington University organization will be recognized by the Committee on Student Life.

ELIGIBILITY FOR STUDENT ACTIVITIES

Any student registered in The George Washington University is eligible to participate in nonathletic student activities of the University; however, a student having a scholastic average of less than 2.00 is not eligible to be:

1. A member of the Band, Dance Production groups, Enosinian Debate Society, Glee Club, Cheerleaders, Student Council, Religious Council, Panhellenic Council, Interfraternity Council, Engineers' Council, Student Life Committee, Adams Hall Council, Hancock Hall Council, Madison Hall Council, Strong Hall Council, Welling Hall Council, or any publications staff.
2. An officer, permanent committee chairman, or member of the executive board of any activity.

The rules and policies of the Southern Conference govern participation in intercollegiate athletics.

The control and administration of all student activities are outlined in a separate bulletin called "Rules and Regulations Governing Student Activities."

SPORTS ACTIVITIES

The University is a member of the Southern Conference and the National Collegiate Athletic Association. Its teams participate in intercollegiate contests in football, basketball, baseball, tennis, golf, rifle, sailing, and crew.

The University maintains a complete program of intramural sports for both men and women. The men's program is conducted by the Intramural Council. The Women's Athletic Association and Intersorority Athletic Board cooperate with the department of Physical Education in conducting the women's intramural and informal extra-mural sports program in tennis, hockey, basketball, rifle, swimming, golf, bowling, and badminton.

Other sports activities are included in the Fencing Club, Sailing Association, and the Rowing Club.

ARTS

The University offers an opportunity for interested students to participate in dance, drama, forensics, and music through the following organizations: Dance Production Groups I, II, III; Enosinian Debate Society; University Dramatic Production Group; and University Glee Club. Each of these groups presents programs during the academic year.

With the cooperation of the Curator of Art, an annual student art exhibit is presented.

ANNUAL EVENTS

Colonial Program.—The Student Council sponsors a series of ten cultural programs to which all students are invited.

Recreation Program.—The Student Council and the Dance Production Groups arrange dances—square, folk, and social—at frequent intervals for all students.

Homecoming.—Scheduled about the middle of the fall semester, Homecoming is the primary festive period of the school year. It includes the annual Pep Rally and Variety Show, the homecoming football game, and the homecoming dance.

Religion in Life Week.—Observed during the week of Thanksgiving, Religion in Life Week includes special lectures, classroom lectures, and fraternity and sorority discussion groups. Religion in Life Week is sponsored by the University Chapel in cooperation with the Committee on Religious Life and the religious organizations.

Holiday Season.—The University traditionally greets the holiday season with appropriate ceremonies including the lighting of the Christmas tree, the singing of Handel's Messiah, and the observance of a special Christmas service at the University Chapel.

Career Conference.—Under the sponsorship of the Student Council, guest speakers from many professions explore annually with students the potentialities of vocations available on graduation.

May Day.—This is the traditional time for the award of honors in student activities. Mortar Board and Omicron Delta Kappa announce and present their new members.

The Colonial Cruise.—An afternoon and evening cruise on the Potomac in the late spring. Students, alumni, and faculty picnic, dance, and engage in games and athletic contests.

Hi-Ball.—An all-University event scheduled during the early part of the spring semester.

STUDENT ORGANIZATIONS

HONOR SOCIETIES

Phi Beta Kappa.—A national honor society recognizing "outstanding intellectual capacity well employed" in the field of liberal arts and sciences. Senior and junior

students who are candidates for the degree of Bachelor of Arts or Bachelor of Science in Columbian College (in exceptional cases, senior and junior students in other nonprofessional divisions of the University) and who have shown broad cultural interests, distinguished scholarly achievement, high character, general promise, and scholarly ideals may, to a number not exceeding 15 per cent of a class, be elected to membership by the Faculty members of the Alpha Chapter of the District of Columbia.

Sigma Xi.—A national scientific honor society, the purpose of which is to encourage original investigation in science pure and applied. Outstanding graduate students in the sciences are eligible for full membership, and undergraduates who have shown marked ability in research may be elected to associate membership.

Aesculapian Society.—An honorary premedical fraternity.

Alpha Kappa Delta.—A national sociology society.

Alpha Lambda Delta.—A national fraternity established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman women who attain a scholastic average of at least 3.50.

Alpha Omega Alpha.—A national honor medical society.

Alpha Pi Epsilon.—A home economics fraternity.

Arnold Air Society.—A national Air Force ROTC society for advanced cadets.

Delphi.—An intersorority society.

Delta Sigma Rho.—A national forensic society.

Gate and Key.—An intrafraternity society.

Iota Sigma Pi.—A national chemical society for women.

Mortar Board.—A national society for senior college women, stressing leadership, scholarship, and service.

Omicron Delta Kappa.—A national fraternity emphasizing leadership in extracurricular activities.

Order of Scarlet.—A service honorary society for sophomore and junior men.

Order of the Coif.—A national legal society, the purpose of which is to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship. Members are elected each year from the highest 10 per cent of the graduating class of the Law School.

Pershing Rifles.—A national Air Force ROTC society for basic cadets.

Phi Epsilon Phi.—A national botany fraternity.

Phi Eta Sigma.—A national fraternity, established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman men who attain a scholastic average of at least 3.50.

Pi Delta Epsilon.—A national collegiate journalism fraternity.

Pi Epsilon Delta.—A national drama honorary fraternity.

Pi Gamma Mu.—A national social-science society.

Psi Chi.—A national psychology fraternity.

Rho Chi Society.—A national pharmaceutical society.

Sigma Alpha Eta.—A national speech and hearing fraternity.

Sigma Epsilon.—A local engineering honorary society.

Sigma Pi Sigma.—A national physics fraternity.

Sigma Tau.—A national engineering fraternity, the purpose of which is to recognize scholarship and professional attainment.

Smith-Reed-Russell Society.—A scholastic society in the School of Medicine. Stu-

dents of the third and fourth years who maintain a scholastic average of 88 per cent are eligible for associate membership.

Tassels.—A service honorary society for sophomore women.

William Beaumont Medical Society.—A society founded with the object of encouraging and stimulating medical students in work of individual investigation.

PROFESSIONAL ORGANIZATIONS

Alpha Chi Sigma (chemistry), Alpha Kappa Psi (commerce and economics), Alpha Zeta Omega (pharmacy), American Institute of Electrical Engineers—Institute of Radio Engineers (student chapter), American Pharmaceutical Association (student branch), American Society of Civil Engineers (student chapter), American Society of Mechanical Engineers (student chapter), Delta Theta Phi (law), Kappa Beta Pi (law), Kappa Psi (pharmacy), Student National Education Association, Nu Sigma Nu (medicine), Phi Alpha Delta (law), Phi Chi (medicine), Phi Delta Delta (law), Phi Delta Epsilon (medicine), Phi Delta Gamma (graduate), Phi Delta Kappa (education), Phi Delta Phi (law), Pi Lambda Theta (education), Society for the Advancement of Management (student chapter), Theta Tau (engineering).

SOCIAL FRATERNITIES

Sigma Chi, Kappa Sigma, Phi Sigma Kappa, Sigma Alpha Epsilon, Sigma Phi Epsilon, Phi Sigma Delta, Sigma Nu, Tau Kappa Epsilon, Pi Kappa Alpha, Tau Epsilon Phi, Alpha Epsilon Pi, Delta Tau Delta.

SOCIAL SORORITIES

Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Kappa Delta, Phi Sigma Sigma, Zeta Tau Alpha, Kappa Kappa Gamma, Delta Gamma, Kappa Alpha Theta, Alpha Epsilon Phi.

DEPARTMENTAL CLUBS

Case Club, Chemistry Club, El Club Español, Engineers' Council, Enosinian Debating Society, Home Economics Club, Howard E. Kane—A.F.A. King Obstetrical Society, Le Cercle Français, Lester F. Ward, Men's Physical Education Club, Sociology Society, Pharmacy Council, Phi Sigma Rho (philosophy), Student Bar Association, Women's Athletic Association.

RELIGIOUS ORGANIZATIONS

Baptist Student Union, B'nai B'rith Hillel Foundation, Canterbury Association, Christian Science Organization, Eastern Orthodox Club, Lutheran Student Association, Newman Club, Religious Council, Student Christian Fellowship, Unitarian Club, United Christian Fellowship, Wesley Foundation.

STUDENT PUBLICATIONS

Amicus Curiae (Law School publication), *The Cherry Tree* (the annual), *The University Hatchet* (weekly newspaper), *The George Washington Law Review*, *Mecheliciv* (engineers' publication), *The Percolator* (pharmaceutical publication), *The Potomac* (literary magazine), *The Student Handbook*.

OTHER ORGANIZATIONS

Adams Hall Council, Alpha Theta Nu (scholarship winners), Big Sisters, Cheerleaders, Colonial Boosters, Colonial Campus Party, Democratic Club, Flying Sponsors, Foggy Bottom Sports Car Club, Hancock Hall Council, Interfraternity Council, Interlaw Fraternity Council, International Relations Club, International Students' Society, Inter-sorority Athletic Board, Junior Panhellenic Association, Madison Hall Council, Old Men, Republican Club, Senior Panhellenic Association, Strong Hall Council, Student Council, Students for Better Government (Political Party), Student Legal Aid Society, Station WRCW, University Pep Band, Wandering Greeks, Welling Hall Council, Writers' Club.

Courses of Instruction

COURSES OF INSTRUCTION

On the following pages of this CATALOGUE, under the alphabetically arranged names of the departments of instruction, are listed the courses of instruction offered by the University in the summer of 1961 and in the academic year 1961-62. The courses as here listed are subject to some slight change. The University reserves the right to withdraw any course announced.

HOURS OF INSTRUCTION

Classes are scheduled in the morning, afternoon, and evening. Evening and day-time sections of the same course are identical, are taught by the same staff of instructors, and carry the same amount of credit. By taking the evening and summer classes and extending the time of study beyond the usual four years, a part-time student may complete the requirements and obtain a degree.

EXPLANATION OF COURSE NUMBERS

In the departments of the School of Medicine, first-year courses are numbered from 101 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and fourth-year courses, from 401 to 500. This includes courses open to both medical and nonmedical students. Courses limited to nonmedical students follow the numbering system used in "all other schools and colleges" (see below).

In the Law School, first-year courses are numbered from 100 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and graduate courses from 401 to 500.

In all other schools and colleges the following system of numbering is used:

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the instructor, and when the completion of additional work has been certified by the instructor.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the instructor to qualified seniors; they are not open to other undergraduates.

INDICATION OF THE AMOUNT OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving 3 hours of credit each semester is marked (3-3), and a semester course giving 3 hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ACCOUNTING*

Professor R. D. Kennedy (Executive Officer)

Visiting Professor Edwin Lewis

Professorial Lecturers F. C. Brimacombe, J. L. Buckler, F. V. Demaret, Frank Higginbotham, G. A. McLaughlin, C. L. Simpson, L. W. Hamilton, I. E. Steele

Associate Professor F. C. Kurtz

Associate Professorial Lecturer O. C. Disler

Assistant Professor E. E. Pontius, Jr.

Lecturers J. P. Fitz-Patrick, R. A. Lucas, W. D. Johnson

Associate J. P. Lewis

Associate in Arts (Junior College—Two-year vocational curriculum in Accounting).—For curriculum see page 56.

Bachelor of Business Administration and Master of Business Administration with a major in Accounting (School of Government, Business, and International Affairs).—See pages 134-35, 136-37, 139-40, and 142.

FIRST GROUP

1-2 *Introductory Accounting (3-3)*

Kennedy and Staff

First half: fall—morning and evening; spring—morning and evening; summer 1961.

Second half: fall—morning and evening; spring—morning and evening; summer 1961.

First half: basic principles underlying accounting records, preparation of the work sheet and financial statements, accounting for single proprietorships and partnerships.

Second half: accounting for corporations and introduction to cost accounting, analysis of financial statements, and valuation and amortization problems. Prerequisite to Accounting 2: Accounting 1 or permission of the instructor.

3 *General Accounting (3)*

Not offered 1961-62. Study of accounting systems and accounting for single proprietorships and corporations, with emphasis on accounting theory, terminology, and the analysis and interpretation of accounting data.

SECOND GROUP

101 *Cost Accounting (3)*

Pontius

Fall—morning and evening; summer 1961. Theory and purposes of industrial cost accounting; treatment of systems of cost control and determination; and analysis and interpretation of cost data. Prerequisite: Accounting 1-2.

102 *Advanced Cost Accounting (3)*

Pontius

Spring—evening. Advanced cost accounting theory and problems with emphasis on development and analysis of standard costs, the use of cost data for managerial control, and distribution cost accounting. Prerequisite: Accounting 101 or permission of the instructor.

111 *Financial Statement Analysis (3)*

Kennedy, Steele

Fall—morning; spring—evening; summer 1961. Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors; influence of price level changes on accounting data; determination and interpretation of trends and ratios. Prerequisite: Accounting 1-2 or permission of the instructor.

115 *Survey of Accounting (3)*

Pontius, Disler, Fitz-Patrick

Fall—evening; spring—evening; summer 1961. Accounting for single proprietorships and corporations with emphasis on the use of accounting information in the management process; study of theory, terminology, and the analysis and interpretation of accounting data. Not open for credit to Accounting or Business Administration majors.

* The Staff of Instruction here listed is for the academic year 1960-61.

121-22 Intermediate Accounting (3-3)

Lewis, Simpson

Academic year—morning and evening. *First half:* valuation and amortization problems of current assets, long term investments, tangible fixed assets, intangible assets, and deferred charges; accounting for current, noncurrent, contingent, and estimated liabilities. Prerequisite to 121: Accounting 2 or permission of the instructor. *Second half:* accounting for the organization, financing, operation, and dissolution of corporations and partnerships; basic principles of consignment and installment sales. Prerequisite to 122: Accounting 121 or permission of the instructor.

132 Accounting Theory (3)

Kennedy, Lewis

Spring—morning; summer 1961. Development of basic accounting principles and concepts with special reference to current thought expressed by the American Institute of Certified Public Accountants and the American Accounting Association. Prerequisite: 6 hours of accounting.

141 Governmental Accounting (3)

Lewis

Fall—evening. Problems relating to governmental appropriation accounts, encumbrances, and fund accounting. Emphasis on municipal and state government accounting with an introduction to federal accounting. Prerequisite: Accounting 1-2 or permission of the instructor.

141 Federal Accounting (3)

Lewis

Spring—evening. Accounting procedures in the Federal Government, with emphasis on agency level accounts, implementation of accrued expenditure legislation, and accounting support for cost based budgets. Accounts of the United States Treasury; current concepts of allotment, obligation, and disbursement accounting and reporting. Prerequisite: Accounting 141 or four semesters of accounting.

147 Federal Budgeting (3)

Lewis

Not offered 1961-62. Budgetary procedures in the Federal Government, with emphasis on agency level budget programming, budget formulation and the techniques for achieving management objectives through the budget process; cost-based budgeting; expenditure programming and accrued expenditure limitations; revenue estimating. Prerequisite: Accounting 144 or extensive experience in federal budgeting.

161 Income Tax Accounting (3)

Kurtz, McLaughlin, Hamilton

Fall—morning and evening. Problems involved in the federal income taxation of individuals and corporations, differences between tax accounting and financial accounting, social security taxes. Prerequisite: Accounting 1-2.

162 Federal Tax Practice (3)

Kurtz, McLaughlin, Hamilton

Spring—morning and evening. Advanced problems of federal tax practice such as the tax treatment of partnerships, estates, trusts, corporate reorganizations, foreign income, and gifts; use of the tax services; assessment, collection, and refund procedures. Prerequisite: Accounting 161 or the permission of the instructor.

171 Auditing (3)

Pontius

Fall—evening. Duties and responsibilities of auditors; principles and procedures of making audits, techniques of verifying each financial statement item, preparation of audit working papers and reports. Prerequisite: Accounting 121-22.

172 Auditing Practice (3)

Pontius

Spring—evening. Preparation of audit reports, accounting statements to be filed with Securities and Exchange Commission, and current developments of auditing standards and practice. Prerequisite: Accounting 171 or permission of the instructor.

181 Accounting Systems (3)

Lewis, Pontius

Fall—evening; spring—morning. Theory and procedure of designing and installing accounting systems, for collecting, recording, analyzing, and presenting accounting data. Prerequisite: Accounting 101, 121-22, and 171, or permission of the instructor.

191 Advanced Accounting (3)

Kurtz, Simpson

Fall—evening; summer 1961. Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Accounting 121-22.

- 193 Business Budgeting (3)** Buckler, Brimacombe, Lewis
 Fall—morning; spring—evening; summer 1961. Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial and industrial organizations. Prerequisite: Accounting 1-2.
- 194 Business Budgeting: Practice and Problems (3)**
 Not offered 1961-62. Practical application of budget principles and techniques; advanced problems involved in general budgetary administration for management control purposes in commercial and industrial business. Prerequisite: Accounting 193 or permission of the instructor.
- 198 Professional Accounting Review (3)** Lewis
 Spring—evening. Review and coordination of the principles and techniques developed in the accounting curriculum, in preparation for general practice in the field of accountancy and for professional accounting examinations. Prerequisite: Accounting 101, 141, 162, 171, and 191, or permission of the instructor.

THIRD GROUP

- 211-12 Managerial Accounting (3-3)** Kennedy, Brimacombe
First half: not offered 1961-62. *Second half:* spring—evening; summer 1961. *First half:* analysis of the accounting system with special reference to the use of financial and operating records and accounting reports as tools of management; a study of valuation and amortization problems including the influence of price level changes on accounting data. Prerequisite: Accounting 1-2 or 3. *Second half:* a survey of internal accounting controls, commercial budgets, and cost accounting systems used by management in directing and controlling a business. Prerequisite to Accounting 212: Accounting 211 or permission of the instructor.
- 215 Survey of Managerial Accounting (3)** Pontius
 Not offered 1961-62. Nature, preparation, analysis, and interpretation of accounting reports; study of cost accounting, business budgeting, and internal accounting controls with emphasis on their use in the management process. Prerequisite: Accounting 1-2, 3, or 115.
- 231 Contemporary Accounting Theory (3)**
 Not offered 1961-62. Advanced accounting principles and concepts and recent theories concerned with the valuation and amortization of assets and determination of income. Admission by permission of the instructor.
- 246 Governmental Accounting and Budgeting Problems (3)**
 Not offered 1961-62. Advanced principles and practices in federal accounting relationship to general policy and administration. Prerequisite: Accounting 144 or permission of the instructor.
- 275 Internal Control and Auditing (3)**
 Fall—evening. Internal accounting controls; review and appraisal of accounting systems, procedures, and managerial policies with respect to their effectiveness and profitability. Emphasis on the use of internal control and auditing as an aid to management. Prerequisite: Accounting 171 or permission of the instructor.
- 295-96 Seminar in Accounting (3-3)** Kennedy
 Academic year—evening. Selected accounting research topics and problems; individual oral and written reports. Admission by permission of the instructor.
- 299-300 Thesis (3-3)** The Staff
 Academic year—as arranged; summer 1961.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the accounting courses listed below for students enrolled in the following special programs:

Navy Graduate Comptrollership Program, Air Force Advanced Management Program, Engineering Administration, and Hospital Administration.

3 General Accounting (3)

115 Survey of Accounting (3)

204 Survey of Cost Accounting (2)

211-12 Managerial Accounting (3-3)

215 Survey of Managerial Accounting (3)

278 Survey of Internal Control and Auditing (2)

293 Budget Preparation and Administration (3)

AIR SCIENCE*

Professor E. M. Wall (*Executive Officer*)

Assistant Professors J. L. Gagnier, L. M. Garrell, T. G. Martin

Instructors Anthony Nassner, A. O. Kevari, C. C. Smarr

Commission in the United States Air Force Reserve.—Upon being awarded a Bachelor's degree and upon the satisfactory completion of the Air Force ROTC course of instruction prescribed by law and regulations, the graduate will be appointed Second Lieutenant, United States Air Force Reserve.

BASIC COURSE

1-2 Leadership Laboratory—*Freshman Year* (1-1)

The Staff

Academic year—afternoon. Cadet basic airman training. Military courtesy, discipline, appearance and bearing; element, flight squadron, and mass formation drill; parades and ceremonies. Minimum 15 hours a semester. Laboratory fee, charged one time a year, \$3. (May be substituted for Physical Education 1-2.)

11-12 Leadership Laboratory—*Sophomore Year* (1-1)

The Staff

Academic year—afternoon. Cadet noncommissioned officer training. Military bearing and courtesy, all phases of drills and ceremonies, command voice training and command responsibility. Prerequisite: Air Science 1-2, 21-22 for men and Air Science 1-2 for women. Political Science 1 or 9 is recommended as an elective during the sophomore year in preparation for Political Science 171 (see Air Science 151-52). Minimum 15 hours a semester. Laboratory fee, charged one time a year, \$3. (May be substituted for Physical Education 11-12.)

21 Air Science—*Freshman Year* (2 or 3)

Fall. Any 2 or 3 semester hour introductory college course in the areas of mathematics, physical and natural sciences, foreign languages, the humanities or social sciences approved by the Division of Air Science as meeting the pre-commission officer educational requirements.

22 Air Science—*Freshman Year* (2)

Garrell

Spring: 2 hours a week—morning and afternoon. General survey of air power to include military instrument of national security, elements and potentials of air power, evolution of aerial warfare, and air vehicles and principles of flight.

51 Air Science—*Sophomore Year* (2)

Martin

Fall: 2 hours a week—morning and afternoon. General survey of the roots and development of aerial warfare to include professional opportunities in the USAF, elements of aerial warfare, employment of air forces, and space operation.

* The Staff of Instruction here listed is for the academic year 1960-61.

52 Air Science—Sophomore Year (2 or 3)

Spring. Any 2 or 3 semester hour introductory college course in the areas of mathematics, physical or natural sciences, foreign languages, the humanities or social sciences approved by the Division of Air Science as meeting the pre-commission officer educational requirements. Political Science 1 or 9 is recommended as an elective during the sophomore year in preparation for Political Science 171 (see Air Science 151-52).

ADVANCED COURSE

101-2 Air Science—Junior Year (1-1)

Gagnier

Academic year—morning. Air Force officer development. Knowledge and skill required of a junior officer in the Air Force. This includes the Air Force commander, his staff, and the air base; the military justice system; and preparation for summer training. Prerequisite or concurrent registration: Business Administration 102 and 193, which are not to be taken in the same semester of the academic year.

103-4 Leadership Laboratory—Junior Year

The Staff

(Credit is a part of Air Science 101-2)

Academic year—afternoon. Cadet noncommissioned officer and officer training. Wearing of the uniform, parades and ceremonies, commands and command voice. Cadets perform duties involving planning for and supervision of Cadet Corps activities. Emphasis placed on leadership and management proficiency. Minimum 15 hours a semester.

105 Summer Training Unit—Between Junior and Senior Years (required)

The Staff

Attendance at a four-week Air Force ROTC summer training unit at an Air Force base within continental United States is mandatory. Program consists of familiarization flying, physical training, individual weapons, Air Force base activity and equipment, field exercises, air base problems, and leadership training.

151-52 Air Science—Senior Year (1-1)

Wall

Academic year—morning. *First half:* weather and navigation. A study of the weather and navigational aspects of airmanship, such as temperature, pressure, air masses, precipitation, weather charts, and dead reckoning navigation. *Second half:* the Air Force officer. A study of materials to help the cadet make a rapid effective adjustment to active duty as an officer of the United States Air Force. Prerequisite or concurrent registration: Political Science 171 and Geography 146, which are not to be taken in the same semester of the academic year.

153-54 Leadership Laboratory—Senior Year

The Staff

(Credit is a part of Air Science 151-52)

Academic year—afternoon. Cadet officer training. Cadet officers conduct activities of Corps of Cadets through chain of command, instruct subordinates, plan and supervise Cadet Corps training and administration. Preparation for commissioned officer duties. Development of leadership and managerial responsibilities. Minimum 15 hours per semester.

ANATOMY*

Professors I. R. Telford (*Executive Officer*), Paul Calabrisi

Professional Lecturer T. D. Stewart

Associate Professors F. D. Allan, T. N. Johnson

Assistant Professor J. B. Christensen

Clinical Instructors R. N. Brown, L. E. Church, L. C. Dearden

Master of Science in the field of Anatomy (Columbian College).—Prerequisite: a Bachelor of Arts or Bachelor of Science degree from this University, or the equivalent, with a major in Biology, Chemistry, or Zoology. The undergraduate program must include the

* The Staff of Instruction here listed is for the academic year 1960-61.

following courses, or the equivalent: Chemistry 11-12, 21, 151-52; Physics 11, 12; Zoology 1-2, 41-42. Biochemistry 221-22 is recommended as an elective.

Required: the general requirements of Columbian College as stated on pages 66-69. The thirty semester hours of graduate work must include Anatomy 203, 204, 205, 221-22, 295-96, 299-300, and graduate courses in biochemistry, physiology, or related fields selected with the approval of the Department. It is not always possible to arrange courses and research so that the student can be assured of completing all the required work in one academic year.

Doctor of Philosophy (Graduate Council).—See page 74.

101-2 Gross Anatomy

Calabrisi and Staff

Academic year: fall—12 hours a week; spring—8½ hours a week. Regional dissection of the human body, supplemented with lectures and quiz sections. Study of X-ray anatomy to emphasize the functional aspects of the position, shape, and relation of the viscera and skeletal components.

103 Human Embryology

Allan and Staff

Fall—3 hours a week. The origin and development of the human body. Special emphasis on the value of embryology in interpreting anatomical anomalies and variations as seen in gross dissection, surgery, obstetrics, and pathology.

104 Neuroanatomy

Johnson and Staff

Spring—5½ hours a week. The macroscopic and microscopic study of the central nervous system and the special sense organs. Emphasis on such dynamic aspects as development, pathways, lesions, etc.

105 Microscopic Anatomy

Telford and Staff

Fall—9 hours a week. Study of the detailed minute structure of cells, tissues, and organs of the human body, with emphasis on the relation of structure to function. Recognition and interpretation of histological sections tested by practical examinations.

106 Living Anatomy

The Staff

Spring—1 hour a week. An introduction to physical diagnosis, with special emphasis on topographical anatomy.

201-2 Gross Anatomy (6-4)

Calabrisi and Staff

Academic year—as arranged. For qualified nonmedical graduate students. Same as Anatomy 101-2. Anatomy 201—laboratory fee, \$21; Anatomy 202—laboratory fee, \$16.

203 Human Embryology (2)

Allan and Staff

Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 103. Laboratory fee, \$8.

204 Neuroanatomy (3)

Johnson and Staff

Spring—as arranged. For qualified nonmedical graduate students. Same as Anatomy 104. Laboratory fee, \$13.

205 Microscopic Anatomy (4)

Telford and Staff

Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 105. Laboratory fee, \$13.

221-22 Seminar (1-1)

Telford and Staff

Academic year: 1 hour a week—as arranged. Research or reports and discussions of special topics by the Staff and graduate students. For graduate students. Medical students are encouraged to attend.

249-50 Introduction to Medical Research* (3-3)

The Staff

Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

* This is an interdepartmental course. The student should register in the department directing his research.

| | |
|--|-----------|
| 295-96 <i>Research</i> (arr.) | The Staff |
| Academic year—as arranged. Fee to be arranged. | |
| 299-300 <i>Thesis</i> (3-3) | The Staff |

ANESTHESIOLOGY*

Professor C. S. Coakley (Executive Officer)

Clinical Professor D. H. Stubbs

Associate Professor Seymour Alpert

Assistant Professor C. R. MacCordy, Paula Kaiser

Assistant Clinical Professor S. N. Albert

Instructors Maria Benzinger, H. E. Curtis, Helene Werner, Patricia Russell

Clinical Instructors W. E. Bageant, Allen Widome, Charles Gruenwald

320 *Anesthesiology* The Staff
 Spring—1 hour a week. The fundamentals of anesthesia are reviewed and correlated with other medical specialties.

421-22 *Anesthesia Seminar* The Staff
 Academic year—1 hour a week. Students attend anesthesia seminars during their surgical clinical clerkships. University Hospital.

433-34 *Advanced Anesthesiology* The Staff
 Academic year—as arranged. Students are rotated through the work of the department for a period of two weeks and assigned to work in the operating rooms and to attend conferences and seminars. For the more advanced students a three-week elective is offered.

ART*

Professors D. C. Kline (Executive Officer), W. A. MacDonald

Associate Professor L. P. Leite

Associate Professorial Lecturer S. J. Wagstaff

Studio Lecturers on the staff of the Corcoran School of Art Edmund Archer, Richard Lahey, Jessalee Sickman, E. F. Walton, Heinz Warneke, Charles Forsythe, Eugene Guillet, Frank Huseman, Peter Masters, Joseph Tancy, Mitchel Jamieson

Bachelor of Arts with a major in (1) Art History and Theory, (2) Drawing and Painting, (3) Sculpture, or (4) Commercial Art (Columbian College—Departmental):

The major in Art History and Theory.—Prerequisite: the Arts and Letters curriculum in the Junior College, or the equivalent, including Art 31-32 and 71-72, see pages 51-52.

Required: in addition to the general requirements stated on pages 61-65, eighteen semester hours, as follows: Art 101, 102, 105, 110, 161-62; and twelve semester hours selected from any second-group course, or from third-group courses open to undergraduates with the approval of the instructor.

The major in Drawing and Painting, Sculpture, or Commercial Art.—Prerequisite: the Arts and Letters curriculum in the Junior College, or the equivalent, including Art 21-22, 41-42, and 31-32 or 71-72.

Required: in addition to the general requirements stated on pages 61-65, twenty-four

* The Staff of Instruction here listed is for the academic year 1960-61.

semester hours of studio practice; six semester hours of art history selected from second-group courses or from third-group courses open to undergraduates with the approval of the instructor.

Classes in the practice of art are held at the Corcoran School of Art.

Bachelor of Arts in Education with a teaching field in Art (School of Education).—

Prerequisite: the Education curriculum, pages 53-54.

Required: the Art option and professional courses listed in the School of Education Catalogue.

*Master of Arts in the field of Art History and Criticism (Columbian College).—*Prerequisite: the degree of Bachelor of Arts with a major in Art History and Theory at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 66-69. As much as possible of the twenty-four semester hours in course work should be in third-group courses. A general written examination on the problems in the field of Art History and Criticism; a written thesis embodying the results of research on some specific topic in the history and criticism of art.

*Master of Fine Arts in the field of Painting or of Sculpture (Columbian College).—*Prerequisite: the degree of Bachelor of Arts with a major in Drawing and Painting, Sculpture, or Commercial Art at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 66-69. As much as possible of the twenty-four semester hours in course work should be in third-group courses. A creative thesis in painting or sculpture; a paper discussing some technical phase of the problem illustrated by the thesis.

ART HISTORY AND THEORY

FIRST GROUP

1 *Art Appreciation* (3)

MacDonald

Fall—morning; spring—morning; summer 1961. A study of the language and function of art in its various media, the development of styles, aesthetic principles, theories, and the ideas in art through the ages. (Primarily for nonmajors.)

31-32 *Survey of Western Art* (3-3)

Leite

Academic year—evening. A survey of the arts in the Western World from prehistoric to modern times. A foundation for further study in the history of art.

71-72 *Introduction to the Arts in America* (3-3)

Kline

Academic year—morning; summer 1961—Art 72 (3). Painting, sculpture, and architecture of America, with selected references to the crafts and popular arts. *First half:* from Colonial beginnings to the Republican Age. *Second half:* from early 19th century to the present.

SECOND GROUP

101 *Ancient Art* (3)

MacDonald

Fall—afternoon; summer 1961.

102 *Medieval Art* (3)

MacDonald

Spring—afternoon. A study of the architecture, sculpture, and painting from the formative stages of Christian Art in the Byzantine Age through the Romanesque and Gothic periods.

105 *Renaissance Art in Italy* (3)

Leite

Fall—morning; summer 1961. The development of painting, sculpture, and architecture in the 15th and 16th centuries in Italy.

106 *Renaissance Art in the North* (3)

Leite

Spring—morning. A study of the painting in the Netherlands, Germany, France, Spain, and Portugal.

107 *Eighteenth Century Art in Europe* (3)

Spring—evening. The development of painting, sculpture, and architecture in 18th century Europe.

- 109 *Nineteenth Century Art in Europe* (3) Leite
Fall—afternoon. The development of European painting and sculpture from Neo-classicism and Romanticism through Impressionism.
- 110 *Contemporary Art* (3) Leite
Spring—afternoon; summer 1961. A study of sculpture and painting from Post Impressionism through the later modern movements to the present.
- 111 *Classical Archeology* (3) MacDonald
Fall—afternoon. A study of archeological monuments of classical civilizations, with intensive study of one or more areas selected from architecture, sculpture, painting, or minor arts.
- 112 *Archeology of the Ancient Orient* (3) MacDonald
Spring—afternoon. A study of archeological monuments of the civilizations of Mesopotamia, Anatolia, Egypt, and Persia.
- 113 *Baroque Art in Italy* (3) (Formerly Art 205) Leite
Summer 1962. The development of painting, sculpture, and architecture in the 16th and 17th centuries in Italy.
- 114 *Baroque Art in the North* (3) (Formerly Art 206)
Fall—evening. The development of painting, sculpture, and architecture in the 16th and 17th centuries in Holland, Flanders, Spain, France, Germany, and England.
- 141 *Interior Decoration* (3) Kline
1962-63—fall. A study of the principles of decoration dealing with furniture designs and ensemble layout, draperies, color, accessories, and lighting.
- 142 *House Planning* (3) Kline
Summer 1962. Study of the contemporary house for family living, including site problems, the case plan, materials of building, and climate conditioning.
- 143 *Folk Arts in America* (3) Kline
Fall—afternoon. Ceramics, woodcarving, ironwork, decorative painting, weaving, and other crafts; selected references to American folk music.
- 161-62 *Theory and Criticism* (3-3) MacDonald
Academic year—morning. The artist on art and the history of art criticism.

THIRD GROUP

- 203 *Primitive Art** (3) Kline
Fall—afternoon. The arts of prehistoric and primitive man in Europe in the pre-Columbian Americas, Oceania, and Africa.
- 204 *Art of the Far East** (3) Kline
Spring—afternoon; summer 1961. The architecture, painting, and sculpture of China, Korea, and Japan.
- 207 *Modern Architecture** (3) Kline
Spring—afternoon. The development of modern architecture and building technology in Europe and America from the late 19th century to the present.
- 210 *Christian Iconography** (3) Leite
Fall—evening. The origins and development of Christian symbols and themes from Early Christian to modern times.
- 211 *Classical Iconography** (3) MacDonald
Spring—afternoon.
- 243 *Seminar in American Art* (3) Kline
Not offered 1961-62.

* May be taken for undergraduate credit with the approval of the instructor.

- 244 *Seminar in Naturalism and Realism* (3) Leite
Not offered 1961-62. A reading knowledge of French is desirable.
- 245 *Seminar in Romanticism* (3) Leite
Spring—evening. A reading knowledge of French and German is desirable.
- 246 *Seminar in Classical Art* (3) MacDonald
Summer 1961.
- 247 *Seminar in Symbolism* (3) Leite
1962-63 and every third year.
- 248 *Special Studies and Research in Classical Art and Archeology* (3) MacDonald
1962-63 and every third year.
- 252 *Museum Techniques** (3) MacDonald
Fall—as arranged. The study and observation of actual work problems in the various departments and museums and galleries. All work to be conducted in museums. Prerequisite: Art 151.
- 271-72 *Museum Techniques** (arr.) MacDonald
Academic year—as arranged. Assignments in intern training in museum work. Students may take this course three days a week from 9:00 A.M. to 5:00 P.M. throughout the academic year and earn 3 credits a semester; or they may take it intensively, 5 days a week from 9:00 A.M. to 5:00 P.M., and earn 6 credits in one semester. Prerequisite: Art 151, 252.
- 289-90 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1961.

DRAWING AND PAINTING, SCULPTURE, AND COMMERCIAL ART†

FIRST GROUP

- 21-22 *Basic Composition and Techniques†* (3-3) Forsythe
Academic year—morning and evening; summer 1961—Art 21 (3). Practice of the basic principles of design; creative exercise in various media to acquire the control of two- and three-dimensional form.
- 41-42 *Drawing and Perspective* (3-3)
Academic year—afternoon and evening. Still life and figure drawing; drawing from casts, and mechanical perspective.
- 65-66 *Drawing and Painting I—Life, Still Life, and Portrait* (3-3) The Staff
Academic year—morning and afternoon; summer 1961—Art 65 (3).
- 81-82 *Sculpture I* (6-6) Warneke
Academic year—afternoon and evening.

SECOND GROUP

- 125-26 *Drawing and Painting II—Life, Still Life, and Portrait* (6-6) Sickman
Academic year—morning and afternoon.
- 127-28 *Drawing and Painting II—Life and Portrait* (6-6) Archer
Academic year—morning, afternoon, and evening.
- 157-58 *Print Making* (6-6) Permuter
Academic year—morning. Relief printing and wood block, with special reference to western and eastern techniques.

* Primarily for candidates for the degree of Master of Arts in the field of Museology and students in the Special Program in Museum Training.

† Art 21-22 is prerequisite to all other studio courses.

- 165-66 *Drawing and Painting II—Life and Portrait* (6-6) Lahey
Academic year—morning, afternoon, and evening; summer 1961—Art 165 (6)*.
- 175-76 *Advanced Composition* (6-6) Forsythe
Academic year—afternoon and evening; summer 1961—Art 175 (6)*. Advanced problems in creative design and composition; development of representational skills.
- 179-80 *Sculpture II* (6-6) Warneke
Academic year—afternoon and evening. Portrait-life modeling and composition in clay, plaster and wood carving.
- 183-84 *Commercial Art* (6-6)
Academic year—afternoon and evening. Drawing of furniture, merchandise, and fashion; lettering and typography; layout; rendering techniques; production methods.
- 185-86 *Advanced Commercial Art* (6-6)
Academic year—afternoon and evening. Layout and illustrative projects in advertising campaigns; reproduction methods in black and white, half-tone mediums, and color; work portfolios.

THIRD GROUP

- 265-66 *Painting III* (6-6) The Staff
Academic year—morning, afternoon, and evening; summer 1961—Art 265 (6)*.
- 275 *Painting IV* (6) The Staff
Fall—as arranged; spring—as arranged.
- 279-80 *Sculpture III* (6-6) Warneke
Academic year—afternoon and evening.
- 281 *Sculpture IV* (6) Warneke
Fall—as arranged; spring—as arranged.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1961.

BIOCHEMISTRY†

Professors J. H. Roe (*Emeritus*), C. R. Treadwell (*Executive Officer*)
 Professorial Lecturers W. R. Carroll, Irving Gray, Arthur Weissbach
 Associate Professor B. W. Smith
 Associate Professorial Lecturer Leon Swell
 Assistant Professors G. V. Vahouny, J. M. Bailey
 Associate H. W. Clark, Jr.

Master of Arts or Master of Science in the field of Biochemistry (Columbian College).—
 Prerequisite: a Bachelor of Arts or a Bachelor of Science degree. The undergraduate program must have included the following courses, or the equivalent: Chemistry 11-12, 21, 22, 151-52; Physics 11 and 12; Zoology 1-2 or Biology 1-2.

Required: the general requirements of Columbian College as stated on pages 66-69. The thirty semester hours must include Biochemistry 221-22, 225-26, 227-28, 299-300. The remaining courses are to be selected from Biochemistry 224, 232, 241, 251, 261, 295-96, or, with the approval of the adviser, from graduate courses in Microbiology, Chemistry, Physiology, or Pharmacology. It is usually not possible to arrange courses and research so that the student can be assured of completing all of the required work in one academic year.

Doctor of Philosophy (Graduate Council).—See page 74.

* May be taken for 3 credit hours with the approval of the instructor.

† The Staff of Instruction here listed is for the academic year 1960-61.

- 113-14 Biochemistry** **The Staff**
 Academic year: lecture (2 hours), conference (1 hour), laboratory (6 hours)—as arranged. Physiological and clinical chemistry. For medical students.
- 221-22 Biochemistry (4-4)** **Vahouny**
 Academic year—Tues. and Thurs., 9:00 to 12:00 A.M. and 1:00 to 2:00 P.M. A lecture and laboratory course for nonmedical students. Prerequisite: Chemistry 22 and 152. Material fee, \$15 a semester.
- 224 Biochemistry of the Enzymes (1)** **Weissbach**
 Spring—Mon., 5:00 P.M. Lecture course dealing with the biochemistry of the enzymes and enzyme reactions. Prerequisite: Biochemistry 113 or 221.
- 225-26 Biochemical Procedures (3-3)** **Smith and Staff**
 Academic year—as arranged. A laboratory course. Material fee, \$16 a semester.
- 227-28 Biochemistry Seminar (1-1)** **The Staff**
 Academic year—Fri., 4:00 P.M. The current literature in the field of biochemistry, mainly for graduate students, but open to a limited number of specially qualified medical students.
- 232 Proteins and Amino Acids (1)** **Carroll**
 Spring—Wed., 5:00 P.M. A lecture course. Prerequisite: Biochemistry 113 or 221.
- 241 Isotopes (2)** **Gray**
 Fall—Sat., 8:00 A.M. Theoretical characterization of isotopes and their applications in biology. Attention will be given to counting, health physics and radiation safety, autoradiography and chromatography.
- 249-50 Introduction to Medical Research* (3-3)** **The Staff**
 Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.
- 251 Carbohydrate Metabolism (1)** **Roe**
 1962-63 and alternate years: Fall—Sat., 9:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.
- 261 Biochemistry of the Lipids (1)** **Swell, Treadwell**
 Fall—Sat., 12:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.
- 295-96 Research in Biochemistry (arr.)** **The Staff**
 Academic year—as arranged.
- 299-300 Thesis (3-3)** **The Staff**

BIOLOGY†

Professor P. W. Bowman (Executive Officer)
 Associate Professor S. C. Munson
 Associate Ivan Huber

Bachelor of Arts or Bachelor of Science with a major in Biology (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in Junior College, see pages 51 and 52.
 Required: the general requirements of Columbian College as stated on pages 61-65

* This is an interdepartmental course. The student should register in the department directing his research.

† See also departments of Botany and Zoology.

The Staff of Instruction here listed is for the academic year 1960-61.

and the grade of "pass" on the Biology major examination during the senior year. The coordinated field of knowledge upon which the student will be examined includes the classification and life histories of plants and animals, ecology, geology, evolution, heredity, the physical and cultural development of man, public health problems, and the history of biology. The course offerings will be correlated and supplemented by supervised study in a proseminar. For further details, see the pamphlet, which is available at the Office of the Dean of Columbian College.

Master of Arts or Master of Science in the field of Biology (Columbian College).—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively, with a major in Biology at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 66-69.

Bachelor of Arts in Education with a teaching field in Biology (School of Education).—Prerequisite: the Education curriculum, pages 53-54.

Required: the Biology option and the professional courses listed in the School of Education Catalogue.

Doctor of Philosophy (Graduate Council).—See page 75.

FIRST GROUP

1-2 Survey in Biology (3-3)

Munson and Staff

Academic year—morning, afternoon, and evening; summer 1961. Systematic study of the plant and animal kingdoms, with emphasis upon the interdependence of living things and their relations with their environments. Introduction to evolution, heredity, public health, and conservation. Material fee, \$7 a semester. Lecture, laboratory, and field trip to nearby countryside, museums, and other places of biological interest.

SECOND GROUP

107-8 Organic Evolution (3-3)

Bowman

1961-62 and alternate years: academic year—evening; 1962-63 and alternate years: academic year—morning. A study of the theories of organic evolution and present ideas on the principal lines of development in the plant and animal kingdoms; a review of the contributions to an understanding of the mechanisms involved in this process from the fields of genetics and cytology. Prerequisite: one year of college work in biology, botany, or zoology.

115-16 Cytology (3-3)

Bowman

Lecture and laboratory. 1961-62 and alternate years: academic year—afternoon; 1962-63 and alternate years: academic year—evening. Plant and animal cells and their components, including the chromosomes and their role in heredity, with training in the preparation of materials for study. Prerequisite: one year of college work in biology, botany, or zoology. Material fee, \$8 a semester.

127 Genetics (3)

Fall—evening. A lecture course in which the general principles are illustrated with specific examples of inheritance in plants and animals, including man. Prerequisite: one year of college work in biology, botany, or zoology.

139 Cell Physiology (3)

Not offered 1961-62. The fundamental physiology of protoplasm. Prerequisite: Chemistry 12 and one year of college biology, botany, or zoology.

199-200 Proseminar in Biology (3-3)

Munson

Academic year—as arranged. Individually planned and directed study by means of which majors in biology may correlate and supplement the subject matter presented in various regular courses.

THIRD GROUP

201-2 Seminar: Cytology (3-3)

Bowman

Academic year—evening.

211-12 Research in Cytology (arr.)

Bowman

Academic year—as arranged; summer 1961.

299-300 Thesis (3-3)

Bowman

Academic year—as arranged; summer 1961.

BOTANY*

Professor R. B. Stevens (Executive Officer)

Professorial Lecturer L. B. Smith

Associate Professorial Lecturers Kittie Parker, Caroline Adams, R. S. Sigafos

Lecturers Edward Hacskaylo, H. M. Cathey, G. A. Livingston, W. A. Shropshire, Jr.

Bachelor of Arts or Bachelor of Science with a major in Botany (Columbian College—Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, including Botany 1-2, Biology 1-2, or the equivalent, see pages 51 and 52.

Required: in addition to the general requirements of Columbian College as stated on pages 61-65, a minimum of twenty-four semester hours of second group courses in Botany or in a combination of Botany and related sciences as approved by the Executive Officer.

Master of Arts or Master of Science in the field of Botany (Columbian College).—Prerequisite: the equivalent of a Bachelor of Arts or Bachelor of Science degree, respectively, from this University with a major in Botany or Biology.

Required: the general requirements of Columbian College as stated on pages 66-69.

Doctor of Philosophy (Graduate Council).—See page 75.

FIRST GROUP

1-2 *General Botany* (3-3)

The Staff

Lecture (2 hours), laboratory (2 hours). Academic year—morning, afternoon, evening; summer 1961. Study of the structure, activities, and development of the flowering plant; a survey of the different kinds of plants, their evolution, ecological relationships, economic significance, and principles of inheritance. Material fee, \$7 a semester.

SECOND GROUP

105 *Field Botany* (3)

Parker

Lecture (1 hour), laboratory and field (4 hours). 1961 and alternate summers. A course, primarily for nonspecialists, emphasizing local flora. Prerequisite: Botany 1 or Biology 1, or permission of the instructor.

107 *Plant Morphology: Lower Groups* (3)

Adams

Lecture (1 hour), laboratory and field (4 hours). 1961-62 and alternate years: spring—evening. Field and laboratory study of the habitat, structure, and identification of representative algae, mosses, and ferns. Prerequisite: Botany 1-2 or Biology 1-2.

109 *Plant Morphology: Seed Plants* (3)

Adams

Lecture (2 hours), laboratory (2 hours). 1961-62 and alternate years: fall—evening. Comparative study of root, stem, leaf, and flower of seed plants, with special reference to economically important families. Prerequisite: Botany 1-2 or Biology 1-2. Material fee, \$8.

116 *Plant Growth* (3)

Hacskaylo

Lecture (2 hours), laboratory (2 hours). 1962 and alternate summers. A course, primarily for nonspecialists, emphasizing practical problems of growing and caring for plants. Prerequisite: Botany 1 or Biology 1, or permission of the instructor. Material fee, \$8.

118 *Physiology of Bacteria and Fungi* (3)

Hacskaylo

Lecture (2 hours), laboratory (2 hours). 1962-63 and alternate years: spring—evening. Lectures, literature reviews, and laboratory studies of the physiology of bacteria and fungi. Prerequisite: Botany 131 or permission of the instructor. Material fee, \$8.

* See also the departments of Biology, Geography, and Zoology.
The Staff of Instruction here listed is for the academic year 1960-61.

125-26 *Plant Taxonomy* (3-3)

Parker

Lecture (1 hour), laboratory and field (4 hours). 1961-62 and alternate years: academic year—evening. A study of the characteristics, phylogeny, and classification of flowering plants. Field collection and identification. Prerequisite: Botany 1-2 or Biology 1-2.

131 *Mycology* (3)

Stevens

Lecture (2 hours), laboratory (2 hours). 1962-63 and alternate years: fall—evening. Prerequisite: Botany 1-2 or Biology 1-2. Material fee, \$8.

133-34 *Plant Pathology* (3-3)

Stevens

Lecture (2 hours), laboratory (2 hours). 1961-62 and alternate years: academic year—evening. Prerequisite: Botany 1-2 or Biology 1-2. Material fee, \$8 a semester.

135-36 *Plant Physiology* (3-3)

Cathey

Lecture (2 hours), laboratory (2 hours). 1962-63 and alternate years: academic year—evening. Prerequisite: Botany 1-2 or Biology 1-2, and Chemistry 11-12. Material fee, \$8 a semester.

141-42 *Plant Ecology* (3-3)

Sigafos

Lecture (1 hour), laboratory and field (4 hours). 1962-63 and alternate years: academic year—evening. Prerequisite: Botany 1-2 or Biology 1-2.

THIRD GROUP

221-22 *Seminar: Taxonomy* (3-3)

Smith

1962-63 and every fourth year: academic year—as arranged.

231-32 *Seminar: Mycology and Plant Pathology* (3-3)

Stevens

1964-65 and every fourth year: academic year—as arranged.

235-36 *Seminar: Plant Physiology* (3-3)

Cathey, Hacsakaylo

1963-64 and every fourth year: academic year—as arranged.

241-42 *Seminar: Plant Ecology* (3-3)

Sigafos

1961-62 and every fourth year: academic year—as arranged.

295-96 *Research* (arr.)

The Staff

Academic year—as arranged; summer 1961—Botany 295 (arr.). Fee to be arranged.

299-300 *Thesis* (3-3)

The Staff

Academic year—as arranged; summer 1961.

BUSINESS AND PUBLIC ADMINISTRATION*

Professors A. R. Johnson, J. L. Jessup, J. C. Dockeray (*Executive Officer*), D. S. Brown†, A. M. Woodruff, G. C. Jacobus, R. B. Eastin, F. H. Gibbs, Richard Ericson, G. L. Lippitt, A. D. H. Kaplan

Professorial Lecturers M. E. Ogdon, K. E. Stromsem, J. L. Krieger, C. W. Clewlow, W. G. Torpey, J. N. Stonesifer, A. C. Lazure, K. F. McClure, F. I. Shaffner, C. E. Houston, Charles Berns, I. S. Schwartz‡, Edward McCrensky, S. N. Alexander, Ezra Glaser, W. J. Peeples, Daniel Wit

Associate Professors John Clayton, Leonard Prestwich, Waldo Sommers

Associate Professorial Lecturers J. P. Murphy, W. W. Edwards, Robert Kaye, L. C. Collins, John Provan, J. R. Snitzler, F. K. McTyier, L. I. Gintzig, V. L. Lewis

* The Staff of Instruction here listed is for the academic year 1960-61.

† On leave of absence spring semester 1960-61.

‡ Deceased.

Lecturers R. J. Bond, George Idelson, J. A. Morrow, W. D. Neighbors, J. F. Doubleday, H. R. Page, W. L. Jabonek, Ross Pollock, D. K. Good.

Bachelor of Business Administration (School of Government, Business, and International Affairs).—For curricula, see pages 55, 137-38.

Master of Arts in Government in the fields of International Affairs, Public Affairs, Public Administration, Personnel Administration, and Economic Policy (School of Government, Business, and International Affairs).—For curricula see pages 140-42.

Master of Business Administration in the fields of General Business Administration, Hospital Administration, and Personnel Administration (School of Government, Business, and International Affairs).—For curricula, see pages 142-45.

Doctor of Business Administration (School of Government).—Prerequisite: a Master's degree in Business Administration or a related field, or the equivalent, and proficiency in Statistics and Accounting to the satisfaction of the Committee on Doctoral Studies.

Required: thirty hours of graduate work beyond the Master's level, the passing of a general examination in six fields, and the writing and defending of a dissertation. See pages 145-46.

Bachelor of Arts in Education with teaching fields in Business Education (School of Education).—Prerequisite: the Education curriculum, pages 53-54.

Required: the Business Education option and the professional courses listed in the School of Education Catalogue.

BUSINESS ADMINISTRATION

SECOND GROUP

- 101 *Introduction to Business* (3) Clayton
(Formerly Business Organization and Combination)
Fall—morning and evening; spring—morning; summer 1961. The business decision-making process; decision areas, tools, and variables; business environment.
- 102 *Fundamentals of Management* (3) Ericson, Page
Fall—morning and evening; spring—morning and evening; summer 1961. Planning, organizing, directing, coordinating, and controlling the activities of the administrative unit; evolution of management thinking.
- 105 *Personnel Management* (3) Eastin, Stonesifer
Fall—morning; spring—evening; summer 1961. Industrial personnel and manpower programs, organizations and policy in personnel activities.
- 106 *Problems in Personnel Management* (3) Eastin, Stonesifer
Spring—morning. Principles of manpower management illustrated by cases drawn from business, industry, and government. Prerequisite: Business Administration 105.
- 107 *Labor-Management Contracts* (3) Sommers
Fall—morning; spring—morning. Management's role in the negotiation and administration of collective bargaining agreements, as essential to development of good labor-management relations.
- 109 *Office Management* (3) Jabonek
Fall—evening; spring—evening. Organization and layout of an office, use of office machines and appliances, planning and execution of work, supervision problems.
- 113 *Real Estate* (3) Doubleday
Fall—evening. Fundamentals of real estate practice; leasing and property management; valuation, financing, and taxation.
- 121 *General Insurance* (3) Doubleday
Spring—evening. A general course in underlying principles of property, life, marine, and casualty insurance, and the function of insurance in the economic life of a business or individual.

- 123-24 *Property and Casualty Insurance A and B* (2-2) Neighbors
1962-63 and alternate years. The principles and practices of property and casualty insurance with emphasis on the economics of insurance, types of carriers, contract provisions, agency and brokerage, and state regulation and supervision.
- 125-26 *Property and Casualty Insurance C and D* (2-2) Neighbors
1961-62 and alternate years: academic year—evening. The principles and practices of property and casualty insurance with emphasis on theory of probability, rates and rating, reserves, financial statements, and investments; loss adjustment and loss prevention. Prerequisite: Business Administration 123-24.
- 127-28 *Property and Casualty Insurance E and F* (2-2) Neighbors
1961-62 and alternate years: academic year—evening. Principles of accounting; principles of business and personal finance; business organization and agency management.
- 129-30 *Property and Casualty Insurance G and H* (2-2) Neighbors
1962-63 and alternate years. Insurance law with particular attention given to construction of insurance contracts, and general commercial law as it relates to contracts, agencies, partnerships, corporations, personal property, real estate and mortgages, negotiable instruments, bankruptcy, bailments, common and private carriers, and negligence.
- 131 *Business Finance* (3) Clayton
Fall—morning; spring—morning and evening. Basic principles involved in the financing of business enterprises. Prerequisite: Accounting 1-2.
- 136 *Credit Management* (3)
Spring—evening. Types and sources of credit information, credit relationships from the standpoint of the commercial bank and the commercial business enterprise. Prerequisite: Accounting 1-2.
- 138 *Investments* (3) Dockeray, Shaffner
Spring—morning; summer 1961. Analysis of factors of investment credit with application to different types of investments, proper selection of investments for various classes of investors, regulation. Prerequisite: Accounting 1-2.
- 141 *Principles of Marketing* (3) Prestwich
Fall—morning; spring—evening; summer 1961. An introduction to marketing structure and its relation to the total economy, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies. Prerequisite: Economics 1-2.
- 142 *Marketing Management Problems* (3) Prestwich
Spring—evening. Practical problems of retailers, wholesalers, and manufacturers considered through the use of cases and text material; fundamental considerations in marketing decisions and the nature of the problem-solving process. Prerequisite: Business Administration 141.
- 143 *Marketing Research* (3) Prestwich
Fall—evening. Principles and practices of marketing research with particular emphasis upon basic methods and techniques, sources and interpretation of data, and presentation of results.
- 145 *Sales Management* (3) Eastin
Spring—evening. Organization of the sales department, sales planning and forecasting, quotas, territories, performance standards, and analysis and control of distribution costs. Prerequisite: Business Administration 141.
- 147 *Advertising* (3) Idelson
Fall—evening. Advertising as a function of marketing and merchandising; uses and limitations of advertising as a tool of management; fundamentals involved in getting a finished advertisement before potential customers; evaluation, criticism, and control of advertising.

- 150 *Procurement and Materials Management* (3) Prestwich
Spring—evening. Purchasing organization, procedures, and policies; market relationships; selection of merchandise and sources of supply; procurement information and records; evaluation of procurement practices in industry and government.
- 151 *Retail Store Management* (3) Prestwich
Fall—evening. Principles and problems in retail store management including financing, location, personnel management, store layout, buying, pricing, stock control, accounting, sales promotion, and customer services.
- 152 *Retail Merchandising and Control* (3) Prestwich
Not offered 1961-62. Managerial problems and policies with reference to profit calculations, pricing, purchase planning, stock control, merchandise and expense budgets, inventory evaluation, and other related phases of retail merchandising. Prerequisite: Business Administration 151 or Accounting 1-2.
- 153 *Principles of Personal Selling* (3) Prestwich
Not offered 1961-62. Basic principles that underlie personal selling and the practical application of these principles. Emphasis is given to the human factor. Career opportunities and the role of selling in our economy are also considered.
- 158 *Traffic Management* (3) Kaye
Not offered 1961-62. Organization and records of traffic department, routing of shipments, services by carriers, rates and charges, relation of shipper to transportation agencies.
- 161 *Commercial Law: Contracts, Sales, Agency, and Bailments* (3) Berns, Collins, McClure
Fall—morning, afternoon, and evening; summer 1961.
- 162 *Commercial Law: Negotiable Instruments, Property, Mortgages* (3) Berns, Collins, Murphy
Spring—morning, afternoon, and evening.
- 163 *Law in Relation to the Form of Business Units: Corporations, Partnerships, and Trusts* (3) Murphy
Not offered 1961-62.
- 171 *Principles of Transportation* (3) Clayton
Fall—evening. Impact of transport on society; development, economic characteristics, services, rates, and regulation of the various modes of domestic intercity transportation.
- 172 *Public Utilities* (3) Clayton
Spring—evening. Legal and economic meaning of the public utility concept; development, services, economic characteristics, ratemaking, and regulation of the various utility industries, with particular emphasis on electric, gas, telephone, and urban transit industries.
- 173 *Commercial Motor Transportation* (3) Clayton
Not offered 1961-62. Organization, management, services, economic characteristics, rates, and regulation of motor transport firms; highways and highway financing considered from the point of view of both producers and users of the services.
- 174 *Commercial Air Transportation* (3) Clayton
Not offered 1961-62. Organization, management, services, economic characteristics, rates, and regulation of air transport firms; policies and activities of the government in the development, promotion, and control of air transport.
- 175 *Introduction to Foreign Trade* (3) Kaye
Fall—evening. Terminology, trade usages and practices, conditions essential to successful trading, economic bases of international trade, obstacles to trade, tariffs, impact of governmental controls on private trade. Prerequisite: Economics 1-2.

- 176 *Exporting and Importing* (3) Kaye
Spring—evening. Policy and operating problems of foreign trade, financing, documentation, packing and transportation of shipments, ocean marine insurance, and U. S. Customs procedure and formalities.
- 178 *Foreign Markets* (3) Ogdon
Not offered 1961-62. Pattern of world trade by countries and commodities, methods of preparing market surveys, selected regional market analyses. Prerequisite: Economics 1-2.
- 191 *Business Reports and Analyses* (3)
Fall—evening. Sources of management information, array and analysis of data, interpretation and presentation of the findings.
- 193 *Management Communication* (3) Morrow
Fall—evening; spring—morning. A survey course in the problems of communication; written communication: style and format; oral communication: oral briefing and presentation; group leadership; rapid reading; completed staff work; and related subjects.
- 195 *Controllership* (3) Edwards
Fall—evening. The duties, responsibilities, and place of the controller in a business organization; relations of controller to other departments and regulatory bodies; and the controller's relation to price setting and inventories, depreciation policies, internal auditing, expense control and budgeting; and financial reports to management, stockholders, and employees. Prerequisite: Accounting 1-2. Open to seniors.
- 197 *Introduction to Business Policy* (3)
Not offered 1961-62. Significance of business policies in management: formulation of policies; relation of various organizational levels to policy making; some significant policies, including case problems.
- 198 *Case Problems in Management* (3) Eastin, Page
Fall—morning and evening; spring—morning and evening. Principles and techniques of management illustrated by cases drawn from business and industry. Prerequisite: Business Administration 102, 105, 131, 141.

THIRD GROUP

- 201 *Advanced Management* (3) Eastin, Gibbs
Fall—afternoon and evening; spring—evening; summer 1961. An advanced course in management emphasizing principles of management in relation to business enterprise.
- 209 *Seminar in Personnel Management* (3) Eastin
Fall—evening. Discussion of industrial personnel and manpower management, and research in advanced problems.
- 210 *The Personnel Manager* (3) Jessup
Spring—evening. The job of the personnel manager and his place in the organization; relations of the personnel manager to other executives; the personnel manager's policy role, and his relations with the chief executive. Key problems of the senior personnel executive.
- 213 *Urban Land Management* (3) Woodruff
Spring—evening. Background course for the developing curriculum in city planning. The course traces the forces that lie behind investment decisions which in turn determine the development of cities.
- 218 *Survey of Data Processing* (3) Doubleday
Fall—evening; spring—evening. A survey of modern data processing systems with emphasis on the management problems associated with the installation and use of such systems.

- 219-20 *Data Processing: Mechanics and Applications* (3-3) Alexander, Glaser
Academic year—evening. Characteristics of major computer systems; relation to their selection and application to administrative processes. Feasibility studies. Relationship of data processing and quantitative methods of management. Case studies. Business Administration 219 is prerequisite to 220.
- 227 *Linear Programming* (3) _____
Fall—evening. Introduction to the vocabulary and methodology of management science through the study of linear programming techniques. Case studies. Minimum mathematical tools are included.
- 228 *Introduction to Operations Research for Management* (3) _____
Spring—evening. Operations research as an approach to the solution of management problems. Emphasis is on the relevance and limitations of operations research. Practical applications are examined. Minimum mathematical tools are included.
- 231 *Corporate Financial Problems* (3) Dockeray, Houston
Fall—evening. Financial practice in promotion, consolidation, and mergers; capital structure adjustments; and reorganization.
- 232 *Seminar in Business Finance* (3) Dockeray, Houston
Spring—evening; summer of 1961. Research in advanced financial problems.
- 237 *Security Analysis* (3) Dockeray, Shaffner
Fall—evening. An advanced course in the applications of investment principles and analytical techniques to the selection of investments. Prerequisite: Business Administration 138.
- 238 *Seminar in Investments* (3) Dockeray, Shaffner
Spring—evening. Research in investment problems, techniques of selection and the management of various types of funds. Prerequisite: Business Administration 138.
- 241-42 *Seminar in Marketing* (3-3) Johnson, Prestwich
Academic year—evening. An advanced course in marketing, emphasizing special and current problems in the field. (Business Administration 241 is not a prerequisite for Business Administration 242.)
- 251 *Seminar in Retail Management* (3) Prestwich
Spring—evening. Research in retailing practices, with emphasis on trends, new developments, and current problems.
- 255-56 *Seminar in Foreign Trade* (3) Ogdon
Academic year—evening. Research, analysis, and discussion of foreign trade institutions, public and private.
- 268 *Management Engineering* (3) Clewlow
Fall—morning and evening. Analysis of the techniques for initiation and implementation of management engineering programs, with emphasis on organization and methods surveys, including the study of work measurements, work simplification, management audits, and other management improvement programs.
- 273-74 *Readings in Business* (3-3) The Staff
Academic year—as arranged. Advanced readings in the fields of finance, marketing, and personnel management. Admission by permission of the instructor.
- 275-76 *Human Relations in Business* (3-3) Lippitt
Academic year—evening. Individual, group, inter-group, and other human behavior and development; application of social science research to business. Practical applications will be emphasized.
- 278 *The Dynamics of Business* (3) Clayton
Spring—evening. An analysis of the structure of American business, including a study of trend and cyclical change in economic activity and their bearing upon governmental policy.

- 286 *Management in the Armed Forces* (3) Jessup
Fall—evening. Special problems of military organization and management; applicability of business management techniques to the armed forces.
- 287 *Relation of Government to Business* (3) Clayton
Not offered 1961-62. Activities of government in their relation to business management in such areas as labor relations, wages, production, and prices.
- 288 *Executive Leadership* (3) Krieger
Spring—evening. Examination of principles and problems of executive leadership and development; intensive consideration of basic issues and guides to executive action in business and public administration; review of the literature, significant research findings, and practical illustrations.
- 291-92 *Seminar in Business Management* (3-3) Ericson, Page
Academic year—evening; summer 1961—Business Administration 292 (3). Research on various phases of management as practiced in American industry.
- 293-94 *Business Research* (3-3) The Staff
Not offered 1961-62.
- 296 *Seminar in Controllershship* (3) Edwards
Spring—evening. Research on advanced problems of the controller in all types of business organization and the Federal Government.
- 297-98 *Business Policy* (3-3) Jessup
Academic year—evening. Problems of management are analyzed with the view of developing a practical solution; cases are used to show the problems of personnel in marketing, industrial management, finance, etc.
- 299-300 *Thesis* (3-3) Dockera y and Staff
Academic year—evening; summer 1961.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following business administration courses for students enrolled in the following special programs: Navy Graduate Comptrollership Program, Air Force Advanced Management Program, and Engineering Administration.

- 107 *Labor-Management Contracts* (3) (Summer 1961)
- 235 *Financial Management* (3)
- 241 *Seminar in Marketing* (3)
- 250 *Contract Administration* (3)
- 253 *Procurement and Distribution* (3)
- 261 *Seminar in Advanced Management* (3)
- 263-64 *Business Organization and Management* (3-3)
- 268 *Management Engineering* (3) (Summer 1961)
- 269 *Readings and Conferences in Controllershship* (2 or 3) (Summer 1961)
- 275-76 *Human Relations in Business* (3-3) (Summer 1961)—Business Administration 275 (3)
- 284 *Readings and Conferences in Management* (2)
- 290 *Research Seminar in Management* (3)
- 295 *Research Seminar in Controllershship* (3)
- 296 *Seminar in Controllershship* (3)

HOSPITAL ADMINISTRATION

THIRD GROUP

- 202 *Introduction to Medical Care Administration* (3)
Lecture (3 hours), laboratory (2 hours). Fall—afternoon and evening. Survey of organizations and activities involved in the maintenance of community health, national public health, hospital bodies, preventive medicine, medical terminology, hospital infection, biostatistics, and environmental sanitation.
- 203-4 *Hospital Administration I-II* (3-3) Gintzig
Lecture (3 hours), laboratory (2 hours). Academic year—afternoon and evening. The history and current character of institutional medical care. Functional and organizational structure of various kinds of hospitals, homes for aged, nursing homes. A weekly laboratory is required during which specific medical care institutions are visited or discussed.
- 205-6 *Studies in Hospital Management I-II* (3-3) Gibbs
Lecture (3 hours), laboratory (2 hours). Academic year—morning and evening. A companion course to Hospital Administration 203-4 providing discussion of problems and cases in hospital management. In addition to regular discussion periods a two hour laboratory is held each Saturday morning.
- 207 *Hospital Management Methods* (3)
Spring—morning and evening. Types of information available to management in hospitals and other medical care institutions; its collection, analysis, and use. Weekly field trips are made to hospitals in the area.
- 209 *Hospital Finance* (3) McTyier
Lecture (3 hours), laboratory (2 hours). Spring—afternoon and evening. Sources of hospital income; timing of fund raising drives; methods of procuring, using, and accounting for hospital funds; impact on the community of the cost of medical care; hospital planning, construction, equipping, and supplying.
- 221 *Survey of Medical Care Organization* (3)
Fall—evening. A survey course for students in other fields who wish an over-all knowledge of hospital, nursing home, and other organizations for medical care. (Not open to majors in Hospital Administration.)
- 222 *Survey of Medical Care Management Procedures* (3)
Spring—evening. A survey course for students in other fields who wish an over-all knowledge of management procedures in hospitals, nursing homes, and similar organizations. (Not open to majors in Hospital Administration.)
- 285-86 *Readings in Medical Care Administration* (3-3) The Staff
Academic year—as arranged. Advanced studies in various aspects of hospital, nursing home, and other medical care administration and management. Admission by permission of the instructor.
- 296-97-98 *Hospital Residency* (3-3-3) Gibbs
Extends for 12 months beginning in June each year. Work experience in a hospital under a qualified preceptor; periodic seminars with University staff or special studies; periodic progress reports and a report of investigation submitted in the form of a thesis. Where appropriate, other courses may be substituted for Hospital Administration 297-98.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged.

PUBLIC ADMINISTRATION

THIRD GROUP

- 210 *The Management Function* (3) Eastin
Spring—evening; summer 1961. Principles and processes of management with particular attention to planning of organization, direction and coordination of work, internal communication, and measurement of achievement in government.

- 211 *Problems of Governmental Organization* (3) _____
 Fall—evening; summer 1961. Theories and principles of organization; analysis of problem areas in administration, such as decentralization, staff-line, field-headquarters, and executive-legislative relationships.
- 212 *Case Studies in Administration* (3) _____
 Spring—evening. Analysis and discussion of problems in public management, approached by the group using primarily the case method.
- 213 *Administration in Government* (3) _____ Brown
 Fall—evening; spring—evening. Selected topics in problems of federal administration, with particular attention to the role of Congress and the public in the administrative processes.
- 215 *Seminar in Comparative Administrative Systems* (3) _____
 Fall—evening. Examination and analysis of the administrative systems of the major foreign governments with particular attention to practices applicable to administration in the United States.
- 216 *Management Analysis and Methods Improvement* (3) _____ Clewlow
 Spring—evening. Management engineering, techniques of organization survey and work analysis, improvement of administrative effectiveness, application of principles of scientific management.
- 217 *New Tools of Management* (3) _____ Brown
 Spring—evening. This course provides information for the advanced student on latest developments in new methods of administration, including electronics devices (automotive equipment), operations research, quality control, attitude measurement, and similar activities.
- 221-22 *Staff Functions in Government* (3-3) _____ Sommers
 Academic year—evening. Designed primarily to provide an understanding of the nature, use, and problems of the staff functions as tools of management. Survey of such staff areas as personnel, budgeting, controllership, procurement, property management, the agency lawyer, security, public relations and information, planning, research, the secretariat, management engineering, auditing, accounting, and administrative services.
- 225-26 *Internship in the Administrative Processes* (3-3) _____ Sommers
 Academic year—as arranged. This course is open only to persons selected by government agencies for participation in approved intern programs.
- 231 *Public Personnel Management* (3) _____ Torpey
 Fall—evening. Basic principles; structure and organization of personnel offices; responsibilities; inter-agency relationships; personnel staffing, training, and work measurement.
- 232 *Personnel Procedures and Problems* (3) _____ Torpey
 Spring—evening; summer 1961. Study of such personnel functions as recruitment, selection, placement, promotion, supervision, evaluation, classification, and training. Practical problems of personnel administration.
- 233 *Seminar in Manpower Development and Utilization* (3) _____ Sommers
 Fall—evening. Research projects and case studies in ways and means of increasing employee potential, use of training programs, executive development, incentive systems.
- 237 *Intermediate Management and Supervision* (3) _____ Eastin
 Fall—evening. The role of the supervisor and intermediate manager, methods for improving group performance, work measurement, pertinent regulations governing federal personnel.
- 241 *Human Relations in Governmental Administration* (3) _____ Lippitt, McCrensky
 Fall—evening. Factors involved in working with people in governmental institutions. Study and research in human problems in management; discussion of programs for improved human relationships.

- 242 *Communications and Executive Action* (3) Morrow
 Spring—evening. Seminar in the communications processes. Research and analysis, identification of factors relating to receptivity; the dynamics of communication.
- 251 *Governmental Budgeting* (3) _____
 Fall—evening; spring—evening. The role of budgeting in management; the principles and practices of budgetary formulation and administration.
- 252 *Seminar in Planning and Programming* (3) Jacobus
 Fall—evening. Performance budgeting; relating the work program to the fiscal program; budgetary evaluation. This course is primarily for students who have completed Public Administration 251.
- 254 *Controllership in the Federal Services* (3) Krieger
 Spring—evening. Function of the controller in federal agencies; special problems analyzed; comparison of the controller function in government and business.
- 259 *Government Procurement and Property Management* (3)
 Not offered 1961-62. Principles and problems of government procurement; accounting and inventory; storage; development of specifications; property management.
- 260 *Seminar in Policy Formulation and Administration* (3) Jacobus
 Fall—evening. Development and administration of agency goals and objectives, influence of individuals upon them; factors involving informal organization such as internal pressure groups, use of sanctions, and role of executive in furthering administrative policy.
- 261 *Public Opinion and the Administrator* (3) Stromsem
 Fall—evening. Theories, techniques, and methods of working with the public; the use of interest groups in developing governmental programs; evaluating public relations programs; the importance of timing; use of public opinion measurement techniques.
- 262 *Contemporary Administrative Theory and Practice* (3) Erierson
 Spring—evening. Current theories and trends in management with particular attention to the behavioral sciences, communications, and applicability of research.
- 271 *Reading and Conference Course in Public Management and Administration* (3) Brown
 Not offered 1961-62. The purpose of this course is to provide advanced students with directed reading in specific areas of public management and administration.
- 272 *Reading and Conference Course in Public Personnel Administration* (3) The Staff
 Spring—as arranged. The purpose of this course is to provide advanced students with directed reading in specific areas of public personnel administration.
- 297 *Seminar in Public Administration* (3) The Staff
 Summer 1961. Advanced research on various phases of public administration including methods of policy formulation and control, the application of systems to management, administration problems of bureaucratic relationships.
- 299-300 *Thesis* (3-3) The Staff
 Academic year—evening; summer 1961.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following public administration courses for students enrolled in the Air Force Advanced Management Program and in Engineering Administration.

- 213 *Administration in Government* (3)
 231 *Public Personnel Management* (3)
 251 *Governmental Budgeting* (3) (Summer 1961)
 260 *Seminar in Policy Formulation and Administration* (3)

CHEMISTRY*

Professors B. D. VanEvera, S. N. Wrenn, C. R. Naeser (*Executive Officer*), R. C. Vincent, W. F. Sager, R. E. Wood

Associate Professors J. W. Harkness, T. P. Perros, W. E. Schmidt, D. G. White

Assistant Professors Natasha Hollbach, R. C. Sentz

Instructor Margaret Ethier

Lecturer Margaret McPherson

Registration.—Before completing registration each student must obtain from the representative of the Department an assignment to lecture, recitation, and laboratory sections.

Bachelor of Arts or Bachelor of Science with a major in Chemistry (Columbian College—Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, see pages 51 and 52. The following first-group courses must be included: Chemistry 11-12, 21, and 22, Mathematics 29 and 30, Physics 11, 12, 13, 16; or 11, 14, 15, and 16.

Required: the general requirements of Columbian College, as stated on pages 61-65, including the following second-group courses: Chemistry 111-12, 113-14, 122, 134 (or 235-36), 151-52, and 135 or 155 (two semester hours), and a grade of "pass" on the chemistry major examination at the end of the senior year. The correlated knowledge upon which the student will be examined includes the following fields: (1) analytical chemistry, (2) inorganic chemistry, (3) organic chemistry, (4) physical chemistry. The work of the junior and senior years must be approved by the Department. Chemistry 153 and the German language are required of all majors who wish to be certified to the American Chemical Society. Others may omit Chemistry 153 and may elect French or Russian. Two foreign languages are recommended for students planning to do graduate work.

Master of Arts or Master of Science in the field of Chemistry (Columbian College).—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Chemistry from this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 66-69. All prospective Master's candidates must take qualifying examinations in the fields of analytical, inorganic, organic, and physical chemistry. These examinations will be given during the first week of classes each semester, and are a part of the prerequisites for all advanced courses. At least two of these examinations must be taken at the beginning of the first year of registration and the remaining one(s) must be taken at the beginning of the second year. Deficiencies, if any, shall be eliminated by assignment to appropriate courses in the 100 group for which a limited amount of graduate credit may, upon petition, be assigned for courses normally taken by seniors. The thirty hours of required work must include Chemistry 213 and at least one three semester hour course in the 200 group in two of the three fields of analytical, inorganic, and organic chemistry. In addition, the thirty hours must include at least four semester hours of laboratory work, Chemistry 193 and Chemistry 299-300. A reading knowledge examination in French or German (German preferred) must be passed before the second half of the work is started.

Doctor of Philosophy (Graduate Council).—See page 73.

Bachelor of Science in Engineering with an option in Chemistry (School of Engineering).—See pages 100-102 and 104-5. The Chemistry courses required for this degree are the same as those required for the Bachelor of Science degree with the major in Chemistry as itemized above.

Bachelor of Arts in Education with a teaching field in Chemistry (School of Education).

—Prerequisite: the Education curriculum, pages 53-54.

Required: the Chemistry option and the professional courses listed in the School of Education Catalogue.

FIRST GROUP

3-4 Fundamentals of Physical Science (4-4)

A year course: credit is not given for the first half until the second half is completed. In Academic year: lecture (3 hours)—morning, laboratory (3 hours)—afternoon. Introduction to methods and achievements of physical science, covering selected topics in chemistry, physics, astronomy, and geology. For nonscience majors. Laboratory fee, \$11 a semester.

Schmidt

* The Staff of Instruction here listed is for the academic year 1960-61.

11-12 General Chemistry (4-4)**The Staff**

A year course; credit is not given for the first half until the second half is completed. Lecture (2 hours), laboratory (4 hours), recitation (1 hour). *First half:* fall—morning, afternoon, and evening; spring—morning, afternoon, and evening; summer 1961. *Second half:* fall—afternoon and evening; spring—morning, afternoon, and evening; summer 1961. Elementary course in general chemistry. Prerequisite: one year of high school algebra. Laboratory fee, \$18 a semester.

21 Qualitative Inorganic Analysis (4)**Vincent**

Lecture (2 hours), laboratory (6 hours). Fall—afternoon and evening, spring—afternoon and evening, summer 1961. Theoretical and practical study of methods of separating and identifying the more common cations and anions using semimicro techniques. Prerequisite: Chemistry 12 or a placement examination which may be waived at the discretion of the instructor. Laboratory fee, \$18.

22 Quantitative Inorganic Analysis I (4)**Schmidt**

Spring: lecture (2 hours)—morning and evening; laboratory (6 hours)—morning, afternoon, and evening; summer 1961. Theory and practice of quantitative analysis by typical volumetric and gravimetric procedures. Prerequisite: Chemistry 21. Laboratory fee, \$18.

SECOND GROUP**111-12 Physical Chemistry Lectures (3-3)****Wood**

A year course; credit is not given for the first half until the second half is completed. Academic year—morning and evening. Introduction to physical chemistry. Students registering for Chemistry 111-12 must register concurrently for Chemistry 113-14 unless they already have adequate credit for physical chemistry laboratory. Prerequisite: either (1) Chemistry 22 and 152, Mathematics 30, Physics 8, or (2) Chemistry 21, Mathematics 30, Physics 14 and 55.

113-14 Physical Chemistry Laboratory (2-2)**Wood**

A year course; credit is not given for the first half until the second half is completed. Academic year—afternoon and Saturday (morning and afternoon). Laboratory to accompany Chemistry 111-12. Students registering for Chemistry 113-14 must register concurrently for Chemistry 111-12 unless they already have credit for lectures in physical chemistry. Laboratory fee, \$18 a semester.

122 Quantitative Inorganic Analysis II (4)**Schmidt**

Fall: lecture (2 hours)—afternoon and evening; laboratory (6 hours)—morning and evening. Continuation of Chemistry 22 including theory and practice of separations, organic reagents, electrochemistry, and colorimetry in analysis. Prerequisite: Chemistry 22. Laboratory fee, \$18.

134 Descriptive Inorganic Chemistry (2)**White**

Spring—morning. An intermediate level course emphasizing the descriptive chemistry of the elements. Prerequisite: Chemistry 22, 151.

135-36 Inorganic Chemistry: Preparations (2-2)**Perros**

First half: fall—morning, spring—evening. *Second half:* spring—evening. Application of the technique of inorganic chemistry to the preparation and purification of a list of selected substances. Prerequisite: Chemistry 152 and 134. Prerequisite or concurrent registration: Chemistry 122. Laboratory fee, \$18 a semester.

151-52 Organic Chemistry (4-4)**Wrenn, Sager**

A year course; credit is not given for the first half until the second half is completed. *First half:* fall—lecture (3 hours), morning and evening; laboratory (3 hours), afternoon and evening; summer 1961. *Second half:* spring—lecture (2 hours), morning and evening; laboratory (6 hours), afternoon and evening; summer 1961. Chemistry of the compounds of carbon. Prerequisite*: Chemistry 21. Laboratory fee: Chemistry 151, \$12; Chemistry 152, \$20.

* This prerequisite may be waived in the case of the student who has earned a grade of C or better in Chemistry 12 within the past two years or by a placement examination.

153 Special Laboratory in Organic Chemistry (1)

Wrenn

Spring—afternoon and evening. A course designed to give the chemistry major additional and broader training in the technique of organic chemistry than in Chemistry 151-52. Prerequisite: Chemistry 151. Prerequisite or concurrent registration: Chemistry 22 and 152. Laboratory fee, \$12.

155 Organic Chemistry: Preparations (2 or 3)

Wrenn

Spring—evening. Synthesis of organic compounds and application of the technique of organic chemistry to the preparation of pure compounds, using larger amounts and greater refinements than in Chemistry 151-52. Prerequisite: Chemistry 22 and 152. Laboratory fee, \$10.50 a semester hour.

156 Qualitative Organic Analysis (3)

Senz

Fall: lecture (1 hour), laboratory (6 hours)—evening. Identification of pure organic compounds, separation of mixtures, and identification of their components. Required of all students planning thesis work in Organic Chemistry. Prerequisite: Chemistry 22 and 153. Laboratory fee, \$18.

191 History of Chemistry (2)

Perros

1961-62 and alternate years: fall—evening. Historical development of chemistry. Prerequisite: Chemistry 22 and 152.

193 Chemical Literature (1)

Wrenn

Fall—evening. A general course in chemical literature with reference work and reports. Prerequisite: Chemistry 22 and 152. Prerequisite or concurrent registration: Chemistry 111-12 and 113-14.

THIRD GROUP*

203 Chemical Kinetics (2)

Wood

1961-62 and alternate years: spring—evening. The rates of chemical reactions and the factors influencing them. Prerequisite: Chemistry 112.

211-12 Physical Chemistry (2-1)

Wood

Academic year—morning and evening. Same course as 111-12. Chemistry 211-12 may be taken for credit only by special permission. Credit will be assigned only upon the satisfactory completion of Chemistry 213.

213 Chemical Thermodynamics (3)

Wood

Fall—evening. Application of thermodynamics to chemical problems. Thermodynamic chemistry, homogeneous and heterogeneous equilibria, statistical calculation of thermodynamic properties, electrochemistry. Prerequisite: grade of A or B in Chemistry 111-12, Satisfactory in 211-12, or qualifying grade in physical chemistry qualifying examination.

216 Statistical Mechanics (3)

Sager

1962-63 and alternate years: fall—evening. An introduction to classical and quantum statistics designed to acquaint the student with the basic principles and application of the method. Prerequisite or concurrent registration: Chemistry 213 or permission of instructor.

217 Chemical Bonding (2)

Sager

1962-63 and alternate years: spring—evening. A survey of modern developments in the theory of valence with emphasis on application to problems of stability and structure of complex molecules. Prerequisite: Chemistry 213 or permission of instructor.

221-22 Advanced Analytical Chemistry (2 or 3-2 or 3)

Schmidt

Lecture (2 hours), laboratory (3 hours—optional). First half: not offered 1961-62. Second half: fall—evening. Theory and application of recent methods of analysis including electrical and optical instrumentation. Prerequisite: Chemistry 22 and 122. The lectures may be taken for 2 credits a semester without laboratory work, either half may be taken first. Laboratory fee, \$11 a semester.

* The appropriate qualifying examination is prerequisite to all advanced courses.

- 231-32 Special Topics in Inorganic Chemistry (2-2)** White, Perros
Academic year—evening. A series of one-semester courses covering such topics as (1) chemistry of the less familiar elements, (2) organometallic, organosilicon, and carbonyl compounds, and (3) co-ordination chemistry. Prerequisite: Chemistry 235.
- 233-34 Radiochemistry (2-2)**
1962-63 and alternate years. The preparation, properties, and uses of radioactive isotopes, both natural and artificial. Prerequisite: Chemistry 235-36.
- 235-36 Inorganic Chemistry (3-2)** Nasser
Academic year—evening. Application of modern chemical theories to inorganic substances and reactions, followed by a detailed study, developed from the periodic table, of the chemistry of the more common elements. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 111-12 and 113-14.
- 251-52 Advanced Organic Chemistry (3-3)** Sager
Academic year—evening. Syntheses, reactions, and properties of carbon compounds, fundamental theories of organic chemistry. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 111-12, 113-14.
- 253 Advanced Synthetic Organic Chemistry (3)** Wrenn
Spring—evening. Study of reactions employed in the synthesis of organic compounds. Prerequisite: Chemistry 251.
- 257 Theoretical Organic Chemistry (3)** Sager
1961-62 and alternate years: fall—evening. Survey of modern theories of organic chemistry with emphasis on reaction mechanisms. Prerequisite: Chemistry 252.
- 291-92 Seminars: Recent Developments in Chemistry (1-1)** The Staff
Academic year—late afternoon.
- 295-96 Research (arr.)** The Staff
Academic year—as arranged; summer 1961. Research on problems approved by the Staff. Open to qualified students with advanced training. Laboratory fee, \$7.50 a semester hour.
- 299-300 Thesis (3-3)** The Staff
Academic year—as arranged; summer 1961. Laboratory fee, \$18 a semester.

CLASSICAL LANGUAGES AND LITERATURES*

Professor J. F. Latimer (*Executive Officer*)
Lecturer Marian McNamara
Associate R. G. Crawford

The Department of Classical Languages and Literatures offers two types of courses: (1) the course on *Greek and Roman Backgrounds in Literature*, which illustrates the literary, linguistic, and cultural backgrounds of Western Civilization, and for which no knowledge of the ancient languages is required. This course is designed to supplement and strengthen the broad general backgrounds of students who plan to concentrate in the fields of English or other literatures, History, Art, Drama, or Philosophy, or of those who wish to increase their general knowledge and appreciation of the bases of the great humanistic traditions as part of a well-rounded education. (2) Two years of Latin and two years of Greek are offered. These courses may be elected in fulfillment of the language requirements of the Junior College as set forth on page 51.

* The Staff of Instruction here listed is for the academic year 1960-61.

COURSE IN ENGLISH TRANSLATION

71-72 *Greek and Roman Backgrounds in Literature* (3-3)

First half: spring—morning. Second half: not offered 1961-62.
Roman masterpieces and their literary influence.

Latimer
Selected Greek and

LANGUAGE COURSES

1-2 *First-year Latin* (3-3)

A year course: credit is not given for the first half until the second half is completed. 1961-62 and alternate years: academic year—evening. Functional presentation of the essentials of the language, with appropriate reading selections. Development of English derivatives, and introduction to Roman life and literature.

Latimer

3-4 *Second-year Latin* (3-3)

A year course: credit is not given for the first half until the second half is completed. 1962-63 and alternate years. A continuation of the preceding course, but with increased emphasis on reading Latin selections which illustrate Roman life and literature. Continuation of vocabulary building in English. Prerequisite: Classical Languages 1-2 or two years of high school Latin.

Latimer

11-12 *First-year Greek* (3-3)

A year course: credit is not given for the first half until the second half is completed. 1962-63 and alternate years. Essentials of grammar. Appropriate reading selections.

Latimer

13-14 *Second-year Greek* (3-3)

A year course: credit is not given for the first half until the second half is completed. 1961-62 and alternate years: academic year—evening. Review of grammar. Emphasis on rapid reading from selected Greek authors.

McNamara

RELATED COURSES IN ANOTHER DEPARTMENT

Art 101 *Ancient Art* (3)

Art 102 *Medieval Art* (3)

DERMATOLOGY AND SYPHILOLOGY*

Professor H. F. Anderson (*Executive Officer*)

Assistant Clinical Professors Hayden Kirby-Smith, J. Q. Cant, Jr.

Associates W. M. Willett, Reuben Goodman, C. S. Brown

Clinical Instructors Manuel Landman, W. G. Ballinger

214 *Dermatology and Syphilology*

Spring—1 hour a week. Lectures on diseases of the skin and syphilis.

The Staff

317-18 *Clinic*

Case demonstrations, diagnosis, and treatment of skin diseases and syphilis. General Hospital.

The Staff
D. C.

407-8 *Clinic*

Two hours a week as arranged in rotation during academic year. and syphilology in infants and children. Children's Hospital.

The Staff
Dermatology

409-10 *Clinic*

Two hours a week as arranged in rotation during academic year. onstrations, diseases of the skin. University Hospital.

The Staff
Clinical dem.

* The Staff of Instruction here listed is for the academic year 1960-61.

ECONOMICS*

Professors A. E. Burns, D. S. Watson, T. W. Holland, J. W. Kendrick, W. E. Schmidt†

Professorial Lecturers Gerhard Colm, R. A. Young, Hans Heymann, Jr.

Associate Professor J. W. Skinner (*Acting Executive Officer*)

Associate Professorial Lecturer R. L. Sammons

Lecturer Henry Solomon

Bachelor of Arts with a major in Economics (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, including Economics 1-2 and Statistics 51, see pages 51 and 52.

Required: the general requirements of Columbian College as stated on pages 61-65 and (1) Economics 101-2 and 121 and fifteen additional hours in second-group courses to be selected with the approval of the adviser: (2) Economics 198 which may be taken upon the completion of Economics 101-2 and 121; (3) Statistics 111, 112; (4) nine semester hours of other second-group courses selected from the following departments—Accounting, Business and Public Administration, History, Philosophy, Political Science, Sociology and Anthropology, and Statistics.

Bachelor of Arts with a major in Latin American Civilization (Columbian College—Field-of-Study).—See the Department of History.

Master of Arts in the field of Economics (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in Economics at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 66-69. The thirty hours of required work must include (1) Economics 210 and nine semester hours in courses numbered 201-208, 213, 215, 216, 251; (2) six semester hours in two of the following fields: public finance, monetary and fiscal policy (Economics 223-24, 261-62); labor economics (Economics 241, 244); economic policy (Economics 265-66); international relations (Economics 281-82, 290); and (3) thesis (Economics 299-300).

Doctor of Philosophy (Graduate Council).—See page 73.

Master of Arts in Government with a major in Economic Policy (School of Government, Business, and International Affairs).—Prerequisite: the degree of Bachelor of Arts with a major in Economics at this University, or the equivalent.

Required: the general requirements for the degree are stated on pages 139-40, 142. The thirty hours of required work must include Economics 210, 265-66, and the thesis, Economics 299-300.

For information concerning other Master of Arts curricula in the School of Government, Business, and International Affairs with courses in Economics, see pages 140-42.

FIRST GROUP

1-2 *Principles of Economics*† (3-3)

Skinner and Staff

Lecture (2 hours), recitation (1 hour). *First half:* fall—morning and evening; spring—morning and evening; summer 1961. *Second half:* fall—evening; spring—morning and evening; summer 1961. Survey of the major economic principles, institutions, and problems in contemporary life. Economics 1 is prerequisite to Economics 2.

SECOND GROUP

101-2 *Economic Analysis* (3-3)

The Staff

First half: fall—morning and evening; spring—evening; summer 1961. *Second half:* spring—morning and evening. Analysis of demand, supply, and commodity pricing; theory of national income determination; pricing of productive services; welfare economics. Economics 101 is prerequisite to Economics 102.

104 *History of Economic Thought* (3)

Burns

Spring—morning. History of the major schools of economic thought; influence of changing problems on the development of economic theory.

* The Staff of Instruction here listed is for the academic year 1960-61.

† On leave of absence fall semester 1960-61.

‡ Economics 1-2 is prerequisite to all other courses in Economics.

- 105 *Business Cycles* (3) Kendrick
Fall—morning. Analysis of strategic factors in economic instability, survey of recent business cycle theories.
- 121 *Money and Banking* (3)
Fall—morning and evening; spring—evening; summer 1961. Theory of money, credit, and banking; commercial banking and the Federal Reserve System; other financial institutions; international aspects of money; current financial problems.
- 123 *Monetary Theory and Policy* (3)
Fall—evening. Principal contemporary theories, background of recent monetary policy.
- 133 *The Economy of the Soviet Union* (3)
Not offered 1961-62. Development and main features of the economic life of the Soviet Union (See History 145-46 and Geography 196).
- 141 *Industrial Relations* (3) Holland
Fall—evening. Development and practice of collective bargaining in American industry. Public control of industrial relations.
- 142 *Labor Economics* (3) Holland
Spring—evening. Wages, hours, and employment; standards of living, public policy.
- 161-62 *Public Finance and Taxation* (3-3)
1961-62 and alternate years: academic year—morning; 1962-63 and alternate years: academic year—evening. General survey of government expenditures; sources and methods of taxation; economic effects of expenditures, taxes, and of government debt policies.
- 165 *Government Control of Economic Activity* (3) Watson
Fall—evening. Changing role of government in promoting and regulating economic activity, types and spheres of control.
- 181-82 *International Economics* (3-3) Schmidt
Academic year—afternoon and evening; summer 1961—Economics 181 (3). Survey of world economics, theories of international trade, analysis of international economic problems and the international organizations.
- 185-86 *Economic History and Problems of Latin America* (3-3) Sammons
Academic year—evening. Evolution of the economies of Latin America with particular emphasis on present structures and problems, considered in the regional, country, and sub-region contexts. Economics 185, special attention to Middle America; Economics 186, special attention to South America.
- 198 *Proseminar in Economics* (3) Skinner
Fall—as arranged; spring—as arranged. Comprehensive survey of economics. Prerequisite: Economics 101-2 and 121.

THIRD GROUP

- 201-2 *History and Literature of Economic Thought* (3-3) Burns
Academic year—evening. Critical analysis and interpretation of the development and the literature of economic thought, origins, and problems, of the major types of theory, and their relation to present problems and policies.
- 203-4 *Contemporary Economic Theory* (3-3) Watson
Academic year—evening. The contributions of Marshall, Chamberlin, Robinson, Hicks, and others.
- 205 *Theory of Employment and Income* (3) Kendrick
Fall—evening. Determinants of the level of employment and income. Keynesian and classical systems contrasted, and recent literature on the subject.
- 206 *Business Cycle Theory* (3) Kendrick
Spring—evening. The general characteristics of business cycle theories and discussion of particular theories.

- 208 *The National Income* (3) Kendrick
Spring—evening. The theory of economic aggregates; measurement and policy aspects of national income.
- 210 *Seminar in Economics* (3) Skinner
Academic year—evening. Integration of economic theories; methods of research. Open only to students who have completed fifteen hours of graduate work in economics.
- 213 *Economic Thought in the Twentieth Century* (3) Burns
Summer 1961. Continuation of Economics 201-2. The principal trends in economic thought during the present century.
- 215 *Introduction to Mathematical Economics* (3) Solomon
Fall—evening. The mathematics of partial and general equilibrium theory. Prerequisite: permission of the instructor.
- 216 *Input-output Analysis* (3) Solomon
Spring—evening. Leontief's theory and subsequent development. Input-output models. Empirical methods and problems. Applications.
- 217-18 *Survey of Economics* (3-3)
Academic year—evening. Survey of economic analysis and policy. Not open to graduate students in economics or economic policy.
- 219 *Managerial Economics* (3) Watson
Summer 1961. Analysis of price, production, and inventory policies of business firms.
- 221-22 *Monetary Theory* (3-3)
Academic year—evening. Contemporary monetary theories.
- 223-24 *Monetary Policy and Central Banking* (3-3) Young
Academic year—evening. The money system in its relation to national income; monetary policies of the Federal Reserve and other central banking systems.
- 233-34 *Economics of Competition* (3-3) Kaplan
Academic year—evening. A study of business competition in order to determine the relationship between theory and practice and to facilitate the development of realistic policies for use in a dynamic economy.
- 241 *Labor Economics* (3) Holland
Fall—evening. Implications of industrialism for labor, questions of social policy, contributions of economics to solutions of labor problems.
- 244 *Collective Bargaining* (3) Holland
Spring—evening. The collective bargaining contract and the elements comprising it, analysis of the policies of labor and of management.
- 246 *Foreign Labor Movements* (3) Holland
Spring—evening. Labor in the economic, social, and political structures of selected foreign countries. Contrasts and comparisons with the United States.
- 251 *Theories of Economic Development* (3) Schmidt
Fall—evening; summer 1961. Growth and change in economic activity, capital accumulation, innovations in technology and business organization.
- 253 *Productivity Analysis* (3) Kendrick
Fall—evening. Concepts and measures of productivity; relations to economic growth and to structural changes in the American economy.
- 261-62 *Public Finance and Fiscal Policy* (3-3) Colm
Academic year—evening. Special problems in contemporary public finance and fiscal policy.
- 263-64 *Theory of Public Finance* (3-3)
Academic year—evening. Criteria for the allocation of government expenditures, principles of taxation, fiscal policy for stable growth.

- 265-66 *Theory of Economic Policy* (3-3) Watson
Academic year—evening. The nature, forms, methods, and objectives of economic policy; the relation of economic theory to economic policy.
- 267 *Economic Organization of the Communist Orbit* (3) Heymann
Fall—evening. Development of the Soviet-type economy; organization under the Soviets; policies and problems: monetary, fiscal, production, allocative, foreign trade, economic growth. (See also History 145-46, 247, and Geography 196.)
- 281-82 *International Economics* (3-3) Schmidt
Academic year—evening. The modern theories of international economics, the variables determining the balance of payments, techniques to obtain balance-of-payments equilibrium.
- 284 *United States Foreign Economic Policy* (3) Schmidt
Not offered 1961-62. Analysis of foreign aid program; international, commercial, and monetary policy of the United States; United States and international economic organization.
- 285-86 *Economic Development of Latin America* (3-3) Sammons
Academic year—evening. Current policies and programs, capital formation, public and private; foreign loans and investment; social and technological preconditions of investment.
- 287-88 *Latin America: Trade and Commodity Policy* (3-3)
Not offered 1961-62. Tariffs and exchange control systems, bilateral and general commercial agreements, terms of trade.
- 290 *Seminar in International Economics* (3) Schmidt
Spring—evening. Advanced topics in international economics. Prerequisite: Economics 281-82 or the equivalent.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1961.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following courses for students enrolled in the Navy Graduate Comptrollership Program and the Air Force Advanced Management Program.

- 191 *Foreign Economic Policies and Problems* (3) Schmidt
195 *Governmental and Industrial Economics* (3) Watson
(Summer 1961)

EDUCATION*

Professors J. H. Fox, B. H. Jarman†, B. S. Root (*Executive Officer*), A. C. LaBue, G. L. Angel

Professorial Lecturers Madaline Remmlein, Florence Lumsden, H. O. Johnson, Anthony Marinaccio, Clayton Hutchins, John Holden, B. D. Joy, Robert Jacobs, J. P. Walsh, D. D. Darland, D. W. Snader

Associate Professors Mary Coleman, W. A. McCauley, Carol St. Cyr

Associate Professorial Lecturers J. C. Lang, LuVerne Walker, R. R. Reed, Eugenia Nowlin, Clara Stratemeyer, Beverly Crump, Mary Scott, H. M. Wilson, Sue Brett

* The Staff of Instruction here listed is for the academic year 1960-61.
† On leave of absence 1960-61.

Assistant Professors H. G. Detwiler, R. E. Baker

Lecturers John Giancaspro, Zella Huse, J. W. Tyler, Ward Whipple, Hazel Wilson, E. M. Logan, C. O. McDaniels, R. W. Eller, W. H. Hayes, H. D. Gardner, R. R. Roberts

FIELD STUDIES

Director J. W. Charles, Assistant Director D. T. McNelis

FIELD SERVICE COORDINATORS

Alexander Anderson, *Assistant Principal, Washington-Lee High School, Arlington, Va.*; Mary Maré, *Assistant Principal, Dean of Girls, Wakefield High School, Arlington, Va.*; C. M. Richmond, *Principal, Stratford Junior High School, Arlington, Va.*

Bachelor of Arts in Education (School of Education).—Prerequisite: the Education curriculum in the Junior College or the equivalent, or a certificate of graduation from an approved normal school or the equivalent, see pages 53 and 54.

Required: the satisfactory completion of a program of at least sixty-six semester hours in addition to the general education background courses in the Junior College curriculum. Each program is planned individually to meet the certification requirements of the student, see pages 123-25 and the School of Education Catalogue.

Master of Arts in Education (School of Education).—Prerequisite: a Bachelor's degree from an accredited institution. Programs are planned individually. The following areas of specialization are available: (1) adult education, (2) classroom teaching—to include strengthening mastery of teaching field, (3) comparative education, (4) curriculum, (5) elementary education, (6) employee training, (7) guidance, (8) history of education, (9) philosophy of education, (10) reading, (11) school administration—secondary or elementary school principalship, and (12) secondary education. (See pages 127-29.)

Advanced Professional Certificate (School of Education).—See pages 129-30.

Doctor of Education (School of Education).—See pages 130-31.

A Reading Clinic

Coleman and Staff

Diagnosis of reading difficulties; individual or group lessons without academic credit. Fee: for individual diagnosis, \$35; for individual instruction, \$4.50 a lesson; for semi-individual instruction, \$3.50 a lesson; for instruction in small groups with common reading difficulties, \$2.75; material fee, \$4.

SECOND GROUP

109-10 Human Development, Learning, and Teaching (3-3) Baker and Staff
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. *First half:* fall—afternoon and evening; summer 1961. *Second half:* fall—afternoon; spring—afternoon and evening; summer 1961. For the general student as well as the prospective teacher. *First half:* nature of human growth, development, and learning, illustrated by observation of children in learning situations. *Second half:* nature of teaching based upon principles of human growth, development, and learning, illustrated by observation of school situations.

111 Methods in Elementary Education (12) Baker and Staff
Fall—Monday through Friday mornings. For seniors in the elementary school curriculum. Methods, materials, appraisal, and field experiences in elementary schools. Problems and procedures in teaching the language arts (including reading, literature for children, oral and written expression, spelling, and handwriting), arithmetic and science, social studies. Planning units of work, general classroom procedures, and evaluation of pupil progress. Observation and participation two mornings a week. Prerequisite: Education 109-10 and 121-22.

112 Educational Measurement (3) Hayes
Fall—afternoon; spring—evening; summer 1961. Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Education 109-10, 121-22.

- 113 Elementary School Art (3)** Nowlin
 Fall and spring: lecture and laboratory (3 hours)—evening, field work—as arranged; summer 1961 (Crump). For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22. Material fee, \$4.50.
- 114 Elementary School Music (3)** Reed
 Fall and spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1961. For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22.
- 115 Teaching of Reading in the Elementary School* (3)** Huse
 Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1961. A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 116 Elementary School Social Studies* (3)**
 Fall: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1961 (Stratemeyer). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 117 Elementary School Science* (3)** St. Cyr
 Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1961. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 120 Elementary School Arithmetic* (3)** Scott
 Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1961 (Baker). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 121-22 Society and the School (3-3)** St. Cyr and Staff
 Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. *First half:* fall—afternoon and evening; summer 1961. *Second half:* fall—afternoon; spring—afternoon and evening; summer 1961. For the general student as well as the prospective teacher. *First half:* the historical and sociological development of education at local, national, and international levels; cooperation of the school with other community agencies. *Second half:* organization and operation of schools; principles and functions; role of the teacher.
- 128 Children's Literature* (3)** Walker
 Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged; summer 1961 (Wilson). For teachers. Exploring and evaluating the newer books for children and the children's classics, understanding the contribution of literature in child development, appreciating children's original expressions. Prerequisite: Psychology 1 and 22.
- 131 Common Teaching Skills in Secondary Schools (3)** Detwiler, Myers, Stallings
 Lecture (2 hours), field work (2 hours). Fall—early afternoon; spring—late afternoon. For seniors in the secondary school curriculum. Course, unit, and lesson planning; practical techniques used in connection with motivation, the assignment, group procedures, directing study, individual differences, evaluation, clerical routines, disciplines, the homeroom, activity sponsorship, public relations. Prerequisite: Education 109-10 and 121-22.
- 134 Student Teaching in Secondary Schools (6 to 9)** Detwiler and Staff
 134A, 134B, 134C, and 134D: spring—as arranged. For seniors in the secondary school curriculum. Sections A and B are for full-time academic majors (Detwiler). Section C is for academic majors in the intensive program (Detwiler). Section D is

* This course may not be taken by students who have completed or who plan to enroll in Education 111.

for physical education majors (Myers, Stallings). Education 134 student teaching-fee, \$50. Admission by permission of the instructor. Prerequisite: Education 109-10 and 121-22.

- 135 *Student Teaching in Elementary Schools* (9) Baker
135A and 135B: spring—as arranged. For seniors in the elementary school curriculum. Student-teaching fee, \$50. Admission by permission of the instructor. Prerequisite: Education 109-10 and 121-22.

SPECIAL METHODS COURSES*

To be elected in the senior year substantial preparation in the teaching fields concerned by the students in the secondary school curriculum. Course requirements and hours of credit vary with license requirements. Practices of successful teachers are studied and actual teaching content as found in current texts and courses of study is reviewed.

- 136 *Teaching English* (2 to 4) Lumsden
Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: eighteen semester hours in English.

- 138 *Teaching Social Studies* (2 to 4) Whipple
Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: twenty-four semester hours of social studies.

- 140 *Teaching Mathematics* (2 to 4) Snader
Spring—evening. Prerequisite*: Mathematics through calculus.

- 144 *Teaching Science* (2 to 4) Eller
Spring: lecture (2 hours)—evening, field work (2 hours)—as arranged. Prerequisite*: twenty-four to forty semester hours of science.

- 146 *Teaching Foreign Languages* (2 to 4) McSpadden
Spring—late afternoon. Prerequisite*: eighteen semester hours of one foreign language.

- 148 *Teaching Home Economics* (2 to 4)
Spring—as arranged. Prerequisite*: thirty semester hours of Home Economics.

- 150 *Teaching Business Subjects* (2 to 4) Shott
Spring—as arranged. Prerequisite*: thirty semester hours of business education.

THIRD GROUP†

- 201-2 *Human Development, Learning, and Teaching* (3-3) McCauley
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. First half: fall—evening. Second half: spring—evening. For graduate students. First half: nature of learning approached through the study of classroom situations. Second half: nature of teaching approached through observation of classroom situations.

- 203-4 *Comparative Education* (3-3) Jacobs
Academic year—evening. Comparison of foreign educational systems with those of the United States, particularly those of Russia, West Germany, Denmark, Switzerland, France, the British Isles, Canada, and Australia.

- 205-6 *The Curriculum*‡ (3-3) St. Cyr
Academic year—evening. For experienced teachers. First half: curriculum foundations and issues; comparison of curriculum patterns. Second half: principles and procedures in curriculum development; group consideration of student problems.

- 207 *Curriculum Materials*‡ (3) St. Cyr
Summer 1961. For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations.

* Prerequisite to all special methods courses: Education 109-10, 121-22, and 131. Additional prerequisites are stated under each course.

† A degree from an accredited institution is prerequisite to all third-group courses.

‡ Prerequisite: adequate professional preparation.

- 209 *Child Growth and Development* (3) Scott
 Fall—evening. An interdisciplinary approach to child development taking into account such factors as society and culture, socialization, and socializing agents with particular emphasis on the home and school.
- 210 *Adolescent Growth and Development* (3) _____
 Spring—evening. A consideration of physical, intellectual, and cultural backgrounds of adolescence with particular emphasis on social development, adjustment to organized society, educational development and adjustment to school, and home relationships.
- 211 *Evaluation in Education** (3)
 Not offered 1961-62. Concept of evaluation, relationship between evaluation of ends and means, steps involved in the evaluation of learning outcomes. As the course progresses each student develops solutions for evaluation problems related to his work situation.
- 212 *Educational Measurement* (3)
 Not offered 1961-62. Basic measurement techniques; construction, selection, administration, and interpretation of objective and essay-type examinations; statistical analysis of test results; laboratory experiences in the use of test instruments.
- 213-14 *History of Education* (3-3) Wilson, Jarman
 Academic year—evening. *First half:* the European backgrounds of American education. *Second half:* the evolution of the American school system.
- 215 *Education of Exceptional Children** (3) _____
 Fall—evening. For classroom teachers. A survey of current problems in the education and guidance of exceptional pupils. Nature and needs of those physically, mentally, or emotionally handicapped; needs of the gifted. Resources for help in correction, diagnosis, therapy, education, and guidance.
- 216 *Education of Slow-learning Children** (3) _____
 Spring—evening; summer 1961. Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties.
- 217-18 *Philosophy of Education** (3-3) Darland, Jarman
 Academic year—evening; summer 1961—Education 217 (3) (Darland). *First half:* designed to help students formulate a personal philosophy of education. *Second half:* social foundations of education—a study of the forces that shape the policies and offerings of the school.
- 219 *Elementary School Classroom Procedures** (3) Baker
 Summer 1961. Current classroom practices with particular emphasis on ways of planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences.
- 221 *Early Childhood Education** (3)
 Not offered 1961-62. For experienced teachers. Emphasis on methods, materials, and learning experiences designed to meet the developmental needs of kindergarten and primary-grade children.
- 223-24 *Reading Problems** (3-3) Coleman
 Academic year—evening. For experienced teachers. Study of reading difficulties on elementary and secondary school levels; classroom and clinical procedures in solving reading problems.
- 225 *Elementary School Reading* (3) Coleman
 Summer 1961. For experienced teachers. Developmental and remedial approaches to reading problems. Demonstration of diagnostic and corrective techniques used by the classroom teacher and the reading specialist.

* Prerequisite: adequate professional preparation.

- 227 *Basic Issues in Elementary Education* (3) Baker
Fall—evening. A consideration of basic issues in the purposes, organization, and conduct of elementary education. Emphasis on the philosophical and psychological roots of fundamental assumptions as they relate to classroom practices.
- 228 *Instructional Areas in Elementary Education* (3) Baker
Spring—evening. Critical appraisal of the objectives, organization, content, and teaching methods in the language arts, arithmetic, social studies, science, arts and crafts, health and physical education.
- 229 *Administration of Elementary Education* (3)
Fall—evening; summer 1961 (Tyler). For experienced teachers and administrators. Administration as a means of achieving instructional objectives, organizing learning and teaching activities, handling supplies and equipment, maintaining the building, and integrating school and community life. Emphasis upon guide lines to action.
- 231 *Secondary School Classroom Procedures** (3) Giancaspro
Fall—evening; summer 1961. Survey of current classroom practices with particular attention to selected topics such as teacher-pupil planning, group procedures, pupil security, initiatory and culminating activities, individual and group evaluation techniques, teaching aids, etc.; review of recent literature.
- 233 *Audio-visual Education** (3) Logan
Spring: lecture (2 hours), laboratory (1 hour)—evening; summer 1961. Role of audio-visual materials in learning; selection, evaluation, and use of materials; administrative problems in the care, operation, maintenance, and use of audio-visual materials and equipment. Material fee, \$7.
- 234 *Teaching Composition in the Junior and Senior High School* (3) Lumsden
Not offered 1961-62. For experienced teachers of English. Methods and materials for improving writing skills; exploring ways to achieve the goal of a theme a week as recommended in the Conant Report. Particular attention to successful techniques, standards of performance, methods of grading; use of style sheets and literary models, and the relationship of the study of grammar to writing.
- 241 *Education of the Gifted** (3)
Fall—Saturday morning; summer 1961. For classroom teachers. Nature and discovery of giftedness; provisions for the gifted in regular classes; experimental projects.
- 243 *Human Relations in the Classroom** (3) Marinaccio
Summer 1961. Principles and practices involved in interpersonal relationships between learner and teacher and among learners.
- 245 *School and Community** (3) Angel
Spring—evening; summer 1961. The school as an important member of a team of social agencies that builds the community.
- 247 *Vocational Education** (3) Walsh
Not offered 1961-62. Development in the United States; current conceptions, agencies involved, problems, and trends.
- 251 *Guidance in Secondary Schools** (3) McDaniels
Fall—evening; summer 1961 (Detwiler). Scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program.
- 252 *Organization and Administration of Guidance Services* (3)
Not offered 1961-62. Designed for guidance directors and supervisors and experienced school counselors who hope to qualify for such positions in the near future. Prerequisite: a minimum of 15 semester hours of approved graduate work in Measurement and Guidance.

* Prerequisite: adequate professional preparation.

- 254 *The Junior High School** (3) Root
Not offered 1961-62. Purposes, organization, core programs, guidance, developing course of study, extra-classroom activities.
- 255-56 *Secondary Education** (3-3) Root
Academic year—evening; summer 1961. *First half:* current proposals for the improvement of secondary education. *Second half:* current problems in each of the subject-matter fields.
- 259-60 *Secondary School Management** (3-3) Johnson
Academic year—evening. For experienced teachers and administrators with two years of successful teaching in secondary schools. Management planning, execution, and control; criteria of good management; construction of the master schedule; leadership problems incident to the development of new policies and programs.
- 263-64 *Employee Training* (3-3) Root
Academic year—evening. *First half:* nature and purpose, review of major programs—orientation, supervisory, apprentice, clerical skills, communication. *Second half:* administrative problems and practices, training media, coordination with other management functions. Prerequisite: adequate professional preparation or two years of experience in employee training.
- 265-66 *Teaching Secondary School English* (3-3) Lumsden and Guest Lecturers
Academic year—evening. A refresher course for teachers of English. Discussion of new approaches to high school content. Offered in cooperation with the departments of English and Speech. *First half:* communication skills—structural linguistics, composition, and speech. *Second half:* American and English literature.
- 267-68 *Teaching Secondary School Social Studies* (3-3) Whipple
Not offered 1961-62. A refresher course for teachers of the Social Studies. Discussion of new approaches to high school content. Offered in cooperation with the departments of History, Political Science, Geography, Economics, and Sociology and Anthropology.
- 270 *Art Education* (3) Nowlin
Not offered 1961-62. For experienced teachers. Basic philosophies of contemporary teachers of art; use of visual and tactile media; emphasis upon visual aids, displays, and use of community resources. Designed to increase awareness of the creative process. Prerequisite: Education 113. Material fee, \$4.50.
- 271 *The Teacher and School Administration** (3) Fox
Fall—morning. A survey course for teachers and prospective administrators. Education and world affairs, national agencies, role of the state, local administration, school finance, legal controls, school plant, public support, democratic administrative procedures, improving teaching conditions.
- 272 *The Teacher and School Supervision** (3) Fox
Spring—morning; summer 1961. Nature, organization, human relationships, and techniques.
- 273-74 *Teacher Education** (3-3) LaBue
Academic year—evening. *First half:* aims, objectives, and basic issues; study of outstanding and experimental programs. *Second half:* recruitment and selection, general education, teaching-field preparation, professional sequences, laboratory experiences.
- 275 *School Finance** (3) Hutchins
Not offered 1961-62. Educational financial theory, practice, and control, including methods of financing.
- 276 *Seminar: Public Relations in School Administration** (3) Joy
Summer 1961. Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making.

* Prerequisite: adequate professional preparation.

- 278 School Law* (3)** Remmlein
Not offered 1961-62. Sources and scope of school law; legal rights and responsibilities of teachers, pupils, and taxpayers. Other legal problems of major interest to the group.
- 279-80 Adult Education* (3-3)** Detwiler, Holden
Academic year—evening; summer 1961—Education 279 (3). *First half:* current concepts and objectives, agencies involved, programs on all levels—international through community. *Second half:* the adult as a learner, the teacher of adults, learning-teaching activities, administration of adult education programs.
- 281 Group Procedures in Education* (3)** Detwiler
Summer 1961. Theory, practice, evaluation, and application to all educational levels.
- 285 Extra-classroom Activities* (3)**
Not offered 1961-62. Nature and purposes of selected activities—homeroom, clubs, assemblies, school publications, student council, interscholastic contest; particular attention to sponsorship, participation, finance, and evaluation.
- 287-88 Clinical Study of Reading Problems* (3-3)** Coleman
Academic year—evening. For advanced students. Diagnostic and corrective work under supervision of the Reading Clinic. Each student is expected to diagnose and treat pupils who are retarded in reading. Case studies are presented and criticized. Prerequisite: Education 223-24 or the equivalent. Material fee, \$5 a semester.
- 289-90 Supervisory Problems in Reading* (3-3)** Coleman
Not offered 1961-62. For experienced teachers, principals, supervisors, and superintendents. Considers the problems involved in planning, reorganizing, and improving the total reading program, in promoting cooperative effort on the part of the staff toward increasing teaching efficiency.
- 291 Planning the School Plant (3)**
Fall—evening. Selection of sites; evaluation of existing buildings; utilization of present facilities; adaptation to curricular needs; building, operation, and maintenance problems.
- 293-94 Research (3-3)** The Staff
Academic year—as arranged. Individual research under the guidance of a member of the staff. Program and conferences arranged with an instructor.
- 295 Educational Research Methods and Procedures (3)** LaBue
Academic year—late afternoon; summer 1961. Required of all candidates for graduate degrees in Education. To be taken early in the student's graduate program. Prerequisite: an elementary course in statistics.
- 296 Seminar in Educational Research (3)**
Not offered 1961-62. Designed to help students analyze scientific approaches to problems in education; evaluate the application of research techniques to typical problems; define, organize, and conduct research studies; and prepare proposals for sponsored research. Required of all candidates for the Doctor of Education degree and open, with permission, to candidates for other advanced degrees. Prerequisite: Education 295 or the equivalent.
- 297 Reading in Education** The Staff
Academic year—late afternoon; summer 1961. To assist those preparing for the comprehensive examinations. No credit toward degree requirements. Tuition fee, \$30.
- 299-300 Thesis (3-3)** The Staff
Academic year—as arranged. Required of all Master of Arts candidates writing Master's theses.
- * Prerequisite: adequate professional preparation.

ENGINEERING*

Professors C. H. Walther, M. A. Mason, J. E. Walters, R. A. Hechtman (*Executive Officer, Civil Engineering*) P. A. Crafton, J. B. Ecker

Adjunct Professors L. A. Guildner, A. G. McNish, G. U. Sorger

Professorial Lecturers F. K. Harris, Nathaniel Stewart, F. P. Hall, Laurence Heilprin, George Tyler, H. L. Stier, Sanford Thompson, Robert Kahal, H. E. Smith, C. H. Conrad

Associate Professors John Kaye, Louis dePian, G. M. Arkilic, N. T. Grisamore (*Executive Officer, Electrical Engineering*), A. C. Murdaugh, R. R. Fox, M. S. Ojalvo

Associate Professorial Lecturer M. C. Soteriades

Assistant Professors L. A. Rubin, J. F. Greenslade, R. L. Dedrick, C. D. Ferris, Sachindranarayan Bhaduri, E. H. Braun, W. J. Mayo-Wells

Lecturers George Abraham, W. W. Balwanz, William Alderson, M. A. Garstens, P. H. Sawitz, L. S. Rotolo, J. A. Cunningham, Howard Eisner, Milton Gussow, D. C. Rohlf, A. H. Schneyman, P. S. Morgan

Instructors R. M. Moore, G. V. Luckyj, A. C. Meltzer

Associates T. B. Wiggins, T. F. Humphrey

Engineering Technologist Certificate (School of Engineering).—See pages 99-101, 112 for statement of requirements.

Bachelor of Civil Engineering (School of Engineering).—See pages 100-103 for statement of requirements.

Bachelor of Electrical Engineering (School of Engineering).—See pages 100-102, 103 for statement of requirements.

Bachelor of Mechanical Engineering (School of Engineering).—See pages 100-102, 103-4 for statement of requirements.

Bachelor of Science in Engineering (School of Engineering).—See pages 100-102, 104-5 for statement of requirements.

Master of Engineering Administration (School of Engineering).—See pages 107-9 for statement of requirements.

Master of Science in Engineering (School of Engineering).—See pages 106-7 for statement of requirements.

Doctor of Science (School of Engineering).—See pages 109-11.

CIVIL ENGINEERING

FIRST GROUP

21 *Rigid Body Mechanics I* (3)

Fall—morning and evening; spring—evening. Fundamental laws of Newtonian mechanics; equilibrium of a particle and a system of particles; beams, cables, trusses, and friction; plane kinematics. Prerequisite: Mathematics 31, Physics 14. The Staff

24 *Strength of Materials* (3)

Fall—evening; spring—morning and evening. Elementary principles of mechanics of deformable bodies; elastic and inelastic behavior, concept of stress and strain in two and three dimensions, strain energy and its application; analysis of axial loading, pure bending, torsion, combined loading, buckling, stress concentration, and fatigue. Prerequisite: Civil Engineering 21, Mathematics 31. The Staff

SECOND GROUP

112 *Surveying* (3)

Spring: lecture (2 hours), field work (2 hours)—Saturday. Plane surveying, including measurements, simple curves, and topographical surveying; space measure- The Staff

* The Staff of Instruction here listed is for the academic year 1960-61.

ments; treatment of observational errors; earthwork computations; field astronomy. Prerequisite: Mathematics 31, Mechanical Engineering 10. Surveying fee, \$13.

121 Rigid Body Mechanics II (3)

The Staff

Fall—morning and evening; spring—evening. General force systems, equilibrium of a rigid body, generalized coordinates and constraints, work and potential energy, kinetic energy and angular momentum, dynamics of a particle and rigid bodies in space, impulsive motion. Prerequisite: Civil Engineering 21, Mathematics 111.

125 Engineering Materials (4)

Murdaugh and Staff

Fall: lecture—morning and evening; laboratory—afternoon and evening. Mechanical and surface properties of engineering solids; relationships between the structure of a material and its mechanical and physical behavior; principles of the control of the properties of metals and nonmetallic solids. Prerequisite: Chemistry 12, Civil Engineering 24, Physics 16. Laboratory fee, \$11.

128 Soil Mechanics (3)

Fox

1961-62 and alternate years: spring—evening; 1962-63 and alternate years: spring—afternoon. Mechanical properties of soils; theory and applications of lateral earth pressure, bearing capacity, and settlement of foundations. Prerequisite: Civil Engineering 125, 137, 144.

132 Fluid Mechanics (3)

Mason and Staff

Spring: lecture—morning and evening; laboratory—afternoon and evening. Development of the fundamental principles of flow of viscous and ideal compressible and incompressible fluids; dimensional analysis and model theory; laboratory work emphasizes principles, analysis of tests, and systematic observations of phenomena. Prerequisite: Civil Engineering 121, Mathematics 111, Mechanical Engineering 113. Laboratory fee, \$11.

135 Hydraulic Engineering (3)

The Staff

1961-62 and alternate years: spring—evening; 1962-63 and alternate years: spring—afternoon. Applied fluid mechanics; pipe and open-channel flow; dams, spillways, and reservoirs; hydroelectric development; drainage and irrigation; control of river flow and floods; water supply and sewerage. Prerequisite: Civil Engineering 137.

137 Applied Earth Sciences (3)

Fox

1961-62 and alternate years: fall—evening; 1962-63 and alternate years: fall—afternoon. Structural geology of rock and soil formations, seismology, climatology, ground water and river flow, hydrology, erosion and sedimentation, conservation. Prerequisite: Chemistry 12, Civil Engineering 125, 132.

143-44 Structural Theory I-II (4-4)

Hechtman, Walther

1961-62 and alternate years: academic year—evening; 1962-63 and alternate years: academic year—afternoon. Theory and structural behavior of statically determinate and indeterminate beams, frames, trusses, and arches, and the application of basic principles to their analysis; plastic collapse of structures; structural laboratory including structural model analysis. Prerequisite or concurrent registration: Civil Engineering 125, Mathematics 111. Laboratory fee, \$11 a semester.

145 Metal Structures (3)

Fox, Hechtman

1961-62 and alternate years: spring—afternoon; 1962-63 and alternate years: spring—evening. Application of structural theory to the analysis and design of metal structures under static and moving loads. Prerequisite: Civil Engineering 144, 157.

146 Reinforced Concrete (3)

Fox, Hechtman

1961-62 and alternate years: fall—afternoon; 1962-63 and alternate years: fall—evening. Theory and design of plain and reinforced concrete structures. Prerequisite: Civil Engineering 144. Prerequisite or concurrent registration: Civil Engineering 157.

154 Structural Dynamics (3)

Arkilic, Fox

1961-62 and alternate years: spring—evening; 1962-63 and alternate years: spring—afternoon. Single degree of freedom systems, energy methods of finding natural frequencies, transient and forced vibration of structures. Prerequisite: Civil Engineering 144, Mathematics 111.

157 Mechanics of Deformable Bodies (3)

Hechtman, Walther

1961-62 and alternate years: fall—evening; 1962-63 and alternate years: fall—afternoon. An introduction to the advanced mechanics of deformable bodies including the theories of elasticity in cartesian and polar coordinates, plasticity of perfectly plastic solids, and elastic stability. Prerequisite: Civil Engineering 125, Mathematics 112. Prerequisite or concurrent registration: Civil Engineering 144 or Mechanical Engineering 123.

165 Engineering Planning and Organization (3)

The Staff

1961-62 and alternate years: fall—afternoon; 1962-63 and alternate years: fall—evening. Planning, organization, administration, and economics of engineering programs and projects, including applications of operations research and electronic computers. Prerequisite: senior standing.

168 Regional and Urban Planning (3)

The Staff

1961-62 and alternate years: spring—afternoon; 1962-63 and alternate years: spring—evening. Regional and urban planning including engineering aspects in connection with transportation, water supply and sewerage, public safety, and convenience. Prerequisite: Civil Engineering 165.

195-96 Problems in Civil Engineering (arr.)

The Staff

Academic year—as arranged. Special problems approved by the Staff. Prerequisite: senior standing.

THIRD GROUP**216 Metal Structures (3)**

Hechtman

Time to be arranged. Structural behavior and failure of metal structures; materials; residual stresses; analysis and design of connections and members; theory of plastic collapse of structures; plastic design.

217 Ultimate Strength of Reinforced Concrete Structures (3)

Fox

Time to be arranged. Modes of failure of reinforced concrete structures; experimental data on failure; ultimate strength concepts for the analysis of beams, slabs, and columns.

218 Prestressed Concrete Structures (3)

Hechtman

Time to be arranged. Structural behavior and failure of prestressed concrete structures; materials; theory, analysis, and design of prestressed concrete structures and members.

224 Theory of Plates and Shells (3)

Arkilic

1962-63 and alternate years: spring—evening. Classical and modern theories of plates and shells, plates and cylindrical shells under different loadings and boundary conditions, equations for plates including shear, rotationally symmetric shells under small deformations and their applications.

226 Plasticity of Solids (3)

Hechtman

1961-62 and alternate years: fall—evening. Plastic flow and fracture of solids; theory of elastic perfectly plastic solids, including basic concepts, limit analysis of beams, rigid frames, and plane stress problems; theory of fracture.

234 Geotechnics in Soil Mechanics (3)

Fox

1962-63 and alternate years: fall—evening. Dynamic geology in the formation and properties of soils; Boussinesq and Westergaard equations for stresses and deformations in soil masses; analysis of settlement; flow of water in soils; solutions of Laplace-type equations for seepage involving foundations, earth dams, and wells; theory of frost action.

235 Theoretical Soil Mechanics (3)

Fox

1962-63 and alternate years: spring—evening. Theories of soil strength and conditions for failure, bearing capacity of footings, pile foundations, theories of lateral earth pressure, stability of slopes, soil dynamics.

- 238 Foundation Engineering (3)** **Fox**
Time to be arranged. Principles of soil mechanics and structural mechanics in the analysis and design of spread footings, mat and pile foundations, retaining walls, sheet piling and water front structures.
- 251 Theory of Structures I (3)** **Hechtman**
Fall—evening. Classical and modern methods of structural analysis; basic theory of plane structures; statically indeterminate structures, including continuous beams and trusses and arches; limit-load analysis; special problems.
- 252 Space Structures (3)** **Hechtman**
1962-63 and alternate years: spring—evening. Continuation of Civil Engineering 251. Theory of structures in three dimensions: trusses, rigid frames, and thin-shell structures.
- 253 Theory of Structures II (3)** **Hechtman**
1961-62 and alternate years: spring—evening. Continuation of Civil Engineering 251. Statically indeterminate structural theory, including single and multi-span rigid frames and arches, deflection theory for arches and suspension bridges, thermal stress, and failure of structures.
- 254 Theory of Structural Dynamics (3)** **Arkilic**
1961-62 and alternate years: spring—evening. Analysis of elastic structures under various dynamic loadings, both steady-state and transient, including vibrations of rigid frames, plates, and thin shells.
- 256 Theory of Elastic Stability (3)** **Hechtman**
1962-63 and alternate years: fall—evening. Beam-column problems and methods of analysis (including numerical analysis); lateral buckling of beams; buckling of rigid frames, arches, plates, stiffened plates, and shells; inelastic buckling.
- 272 Experimental Structural Analysis (3)** **Hechtman**
Time to be arranged. Experimental analysis of truss, rigid frame, plate, and shell structures; large- and small-deflection models; similitude.
- 275 Concepts of Structural Design (3)** **Hechtman**
Time to be arranged. Mechanical behavior and failure of structures as determined by properties of materials, nature of structure, and type of loading; selection of type of structure; structural analysis, its applications and possible simplifications.

ELECTRICAL ENGINEERING

FIRST GROUP

- 11-12 Fundamentals of Electrical Engineering (3-3)** **The Staff**
Fall—morning and evening; spring—morning and evening. Electric and magnetic fields, d-c and a-c electrical circuits and networks, energy sources, electromechanical energy conversion, power, electronic devices, and circuits. *First half:* fields and circuits. *Second half:* energy, power, and electronics. Prerequisite to Electrical Engineering 11: Physics 15 and Mathematics 111 or concurrent registration. Prerequisite to Electrical Engineering 12: Electrical Engineering 11.

SECOND GROUP

- 102 Engineering Electronics (3)** **dePian, Eisner**
Spring—morning and evening. Vacuum tube and solid state devices as circuit elements, equivalent circuits, voltage and power amplifiers, feedback amplifiers, oscillators, relaxation circuits. Emphasis placed on design of electronic circuits. Prerequisite: Electrical Engineering 12, Mathematics 112.
- 103 Electric and Magnetic Fields (3)** **Ferris, Meltzer**
Fall—morning and evening. Introduction to vector analysis and its application to static electric and magnetic fields; method of images, solid angle, particle motion in electric and magnetic fields. Prerequisite: Electrical Engineering 12, Mathematics 112.

- 104 Field Analysis (3)** Ferris, Meltzer
Spring—morning and evening. Vector potential, magnetic scalar potential, conformal mapping, solutions of Laplace's equation, field plotting, analogues. Introduction to Maxwell's equations and electromagnetic waves. Prerequisite: Electrical Engineering 103, Mathematics 112.
- 107 Steady-state Network Analysis (3)** Ferris
Fall—morning and evening. Four-terminal networks, network theorems, poles and zeros of network functions, resonance, filters, coupled circuits, transmission lines. Fourier series, matrices. Prerequisite: Electrical Engineering 11, Mathematics 112.
- 111 Electrical Measurements (2)** Harris, Rubin
Fall—morning and evening. Systems of units; theory of errors; d-c indicating instruments and galvanometer dynamics; precision measurement of voltage, current, and resistance. Prerequisite: Electrical Engineering 11, Mathematics 112.
- 112 Electrical Measurements (2)** Harris, Rubin
Spring—morning and evening. Theory of a-c indicating instruments, a-c bridge waveforms, frequency measurements, measurement of power and energy. Prerequisite: Electrical Engineering 107, 111.
- 113-14 Electric Power Laboratory (2-2)** Meltzer
Academic year—afternoon and evening. Experiments in d-c and a-c circuits, instruments, and machines. Prerequisite to Electrical Engineering 113: Electrical Engineering 12. Prerequisite to Electrical Engineering 114: Electrical Engineering 113. Laboratory fee, \$11 a semester.
- 118 Electrical Energy Conversion (3)** Meltzer, Rubin
Spring—morning and evening. Analysis of physical systems involving electrical, mechanical, and thermal energy conversion; mathematical formulations using the Euler-Lagrange equation; transient and steady-state analysis of special machines including the generalized rotating energy converter. Prerequisite: Electrical Engineering 12, Mathematics 112. Prerequisite or concurrent registration: Electrical Engineering 104, 112.
- 122 Measurements and Electronics Laboratory (2)** Rohlf, Rubin
Spring—afternoon and evening. Experiments with sources, meters, bridges, and simple electronic devices; network theorems and resonance; use of instruments and oscilloscope; measurement of resistance, capacitance, inductance. Prerequisite or concurrent registration: Electrical Engineering 102, 112. Laboratory fee, \$11.
- 123 Electronic Devices and Systems Laboratory (2)** Rohlf, Rubin
Fall—afternoon and evening. Theory and use of electronic devices and instruments. Experiments in active networks, tubes and transistors, nonlinear elements, complex waveform analysis, transfer characteristics. Prerequisite: Electrical Engineering 122. Prerequisite or concurrent registration: Electrical Engineering 137. Laboratory fee, \$11.
- 124 High-frequency Communications Laboratory (2)** Rohlf, Rubin
Spring—afternoon and evening. Experiments at radio- and microwave-frequencies: impedance, amplifiers, transmitters, lines, waveguides, slotted lines, antennas, horns, power, oscillators. Prerequisite: Electrical Engineering 123. Prerequisite or concurrent registration: Electrical Engineering 136. Laboratory fee, \$11.
- 125-26 Project Laboratory (2-2)** Rubin
Academic year—as arranged. Creative projects and experiments with electrical and electromechanical devices and systems carried out under individual supervision. May be substituted for required courses. Prerequisite: Electrical Engineering 122, senior status, and permission of instructor. Laboratory fee, \$11 a semester.
- 127 General Network Analysis and Synthesis (3)** Ferris
Fall—morning and evening. Solutions of linear integro-differential equations using transformation calculus. Laplace transforms, Fourier integral, poles and zeros of network functions, correlation of time and frequency domains, elements of network synthesis. Prerequisite: Electrical Engineering 107, Mathematics 112.

- 133 Engineering Analysis (3)** dePian
 Fall—morning. Application of fundamental principles of engineering, physics, and mathematics to problems in various fields of engineering. Emphasis is placed on problem solving using concepts previously studied. Prerequisite: Civil Engineering 121, Electrical Engineering 102, Mathematics 112, Physics 16.
- 136 Electromagnetic Waves (3)** de Pian, Grisamore
 Spring—morning and evening. Electromagnetic waves in bounded media, radiation from antennas, high-frequency transmission lines, cavity resonators, and microwave devices. Prerequisite: Electrical Engineering 104, Mathematics 112.
- 137 Electronic Circuits and Systems (3)** dePian
 Fall—morning and evening. Analysis of two-port networks; matrix representation of linear active networks; vacuum-tube and semiconductor circuit theory; concepts of feedback, stability, and oscillators. Nonlinear circuit analysis, modulation, detection, communication systems. Prerequisite: Electrical Engineering 102 or Physics 132, Electrical Engineering 107, Mathematics 112.
- 171 Digital Circuitry and Systems (3)** Grisamore
 Fall—late afternoon. Introduction to basic concepts of modern digital programmed systems, mathematical foundations and techniques for logical design of digital circuits, electronic design of computer circuits. Prerequisite: Mathematics 111, Electrical Engineering 102 or Physics 132.
- 172 Digital Techniques (3)** Rotolo
 Spring—late afternoon. Continuation of Electrical Engineering 171. Automatic programming techniques, self-detecting and correcting codes, advanced logical circuit design, electronic design of digital transistor and magnetic-core circuits, memory systems, analog-to-digital techniques, wiring diagrams. Prerequisite: Electrical Engineering 171.
- 174 Digital and Analog Computer Laboratory (2)** Wiggins
 Spring—afternoon. Theory and use of digital and analog computers: programming, operating, logical circuitry, design, troubleshooting. Prerequisite: Electrical Engineering 137, 171. Laboratory fee, \$11.
- 189 Undergraduate Thesis in Electrical Engineering (2)** The Staff
 Academic year—afternoon and evening. Individual research projects in electrical engineering.
- 191 Proseminar in Digital Computers (1)** Grisamore
 Fall—late afternoon; spring—late afternoon. Oral and written presentation of technical and nontechnical papers based on current literature and on original studies, with group discussion and critical analysis. Prerequisite: senior status.

THIRD GROUP

- 203 Operational Analysis of Linear Systems (3)**
 Fall—evening. Transient analysis of linear, lumped-parameter electrical and mechanical systems by operational methods with emphasis on Laplace transforms.
- 205 Electronic Circuit Analysis (3)** dePian
 Spring—evening. Methods of linear and nonlinear analysis applied to passive and active networks including vacuum-tube and transistor circuits, and magnetic and dielectric amplifiers.
- 207 Steady-state Network Analysis (3)** Ferris
 Spring—evening. Analysis of lumped, linear networks: determinants, loop and node analysis, network theorems, four-terminal networks, filters, complex frequency, network functions, and general network properties.
- 209 Electromagnetic Field Analysis (3)** Sawitz
 Fall—evening. Electrostatics, magnetics, and Maxwell's equations: solutions of Laplace's equation, retarded potentials, electromagnetic waves in bounded media, field analysis techniques.

211 Physical Electronics (3)

Ferris

Fall—evening. Physical principles underlying operation of various electronic devices including vacuum tubes, electron lenses, transistors, and recent solid-state electronic devices.

215 Analysis of Modulation and Noise (3)

Alderson

Spring—evening. Analysis by Fourier series and integrals of signals and linear networks, modulation and spectra, noise analysis including probability method of determining power spectra.

231 Basic Concepts of Digital Computers (3)

Cunningham

Spring—evening. The programmed system, logical and system design of digital computers, special-purpose digital computers, theory of switching circuits and computer logic, reliability, digital electronic circuits, modern developments.

ENGINEERING ADMINISTRATION

The School of Engineering offers the following courses primarily for candidates for the degree of Master of Engineering Administration. Other courses listed in this program are offered by the departments of Accounting, Business and Public Administration, Psychology, and Statistics.

SECOND GROUP**191 Engineering Law* (3)**

The Staff

Spring—evening. The influence of contract, property, and tort law upon engineering activities. Legal principles relating to the organization and management of engineering companies and governmental departments; legal procedures of interest to engineers. Topics considered include contracts, agency, partnership, corporations, liens, and expert testimony.

THIRD GROUP**201 Engineering Administration I (3)**

Greenslade and Staff

Fall—evening; spring—evening. Application of scientific method to the administrative processes of (1) planning and (2) organizing; including development of objectives, key factors in planning, basics of organization, stages of organizational growth, special problems of organization in an engineering or scientific enterprise.

202 Engineering Administration II (3)

Greenslade and Staff

Fall—evening; spring—evening. Continuation of Engineering Administration 201. Application of scientific method to the administrative processes of (3) managing or directing and (4) evaluation and control. Study of delegation; decentralization; personnel relations; management development; systems engineering; automation; financial analysis, budgeting, and administrative audits.

206 Human Relations in Administration (3)

Fall—evening; spring—evening. The meaning, principles, and practices of management development and personnel relations; collective bargaining; principles and practices of personnel administration; professional social relations.

251 Management of Research and Development (3)

Fall—evening; spring—evening. Management problems involved in the administration of research and development programs; exploration of techniques in programming; the planning of research and development; selection of organizations for research, maintenance, control, and evaluation of projects.

252 Production and Maintenance Management (3)

Smith

Fall—evening; spring—evening. Planning, organizing, and managing of production and systems. Managerial implications of automation. Study of skills and abilities essential to industrial management, including maintenance of equipment and real property.

* An undergraduate course which may be taken for graduate credit with the approval of the Committee on Graduate Studies.

- 261 *Economic Analysis in Engineering Planning* (3) Hall and Staff
Fall—evening; spring—evening. Application of economic principles to engineering administration: inputs, outputs, investments, and prices. Studies are made of the methods of analyzing economic factors in evaluating alternate courses of administrative action in government and industry.
- 263 *Quantitative Techniques of Engineering Administration* (3) The Staff
Spring—evening. Application of the various quantitative techniques, mathematical, statistical, and other management sciences' techniques to the analysis of engineering administration and the solution of administrative problems by the use of models, theories, and measurements.
- 271 *Operations Research* (3) Kaye
Fall—evening; spring—evening. Background and application of operations research; history, characteristics, capabilities, administrative considerations, cases, methods, and techniques, including construction of conceptual and mathematical models.
- 272 *Problems in Operations Research* (3) Kaye
Spring—evening. Illustrations of the application of operations research by study of case histories: examples of the formulation and preliminary order-of-magnitude case; examples of broader scope.
- 273-74 *Techniques of Operations Research* (3-3) Heilprin
Academic year—evening. Theory and application of techniques used in operations research, including order-of-magnitude estimation, probability and mathematical statistics, symbolic logic, inequality-constrained stationary-value problems, dynamics of populations, Monte Carlo simulation, strategic gaming, and error and sensitivity analysis.
- 285 *Seminar in Administrative Problems* (3) The Staff
Academic year—evening. Individual analysis of complex administrative problems, with group evaluation and discussion. Prerequisite: admission to candidacy and completion of at least 18 semester hours of graduate study.
- 295 *Applied Research in Engineering Administration* (arr.)
Fall—as arranged; spring—as arranged. Application of established principles to new engineering administrative situations; the development of new knowledge of administration.
- 296 *Research in Engineering Administration* (arr.)
Fall—as arranged; spring—as arranged. Creative thinking in engineering administration, initiation of new theories and principles, development of new hypotheses, experimentation, proof of theories and hypotheses.
- 299-300 *Thesis* (3-3)
Academic year—as arranged.

ENGINEERING SCIENCE

The following courses serve as foundations for specialization, since they are concerned with a body of knowledge applicable in a variety of engineering fields.

SECOND GROUP

- 130 *Introductory Astronomy* (3) Grisamore
Spring—evening. Coordinate systems and nomenclature used in astronomy, description of astronomical systems from solar system to metagalaxies, introduction to celestial mechanics, types of stars, stellar physics. Prerequisites: integral calculus and one year of college physics.
- 154 *Automatic Control** (4) Crafton, dePian
Spring—morning and evening. Theory of automatic control systems including electromechanical, pneumatic, and hydraulic systems. Transient analysis, transfer

* An undergraduate course which may be taken for graduate credit with the approval of the Committee on Graduate Studies.

functions, stability criteria. Experimental study of automatic control systems. Lecture and laboratory. Prerequisite: Electrical Engineering 127 or Mechanical Engineering 123. Laboratory fee, \$11.

THIRD GROUP

- 201 *Automatic Control* (3) Crafton
Fall—evening. Advanced theory of automatic control. Systems analysis, multiple loop systems, nonlinear systems.
- 211 *Analysis of Engineering Systems I* (3) Arkilic
Fall—afternoon and evening; spring—evening. A course in the mathematical analysis of engineering systems employing such topics as complex variables, infinite series, orthogonal functions, matrices and vector spaces, partial differential equations, probability, and calculus of variations. The required level of preparation is equivalent to Mathematics 111 and 112 as given at this University.
- 212 *Analysis of Engineering Systems II* (3) Arkilic
Fall—evening; spring—evening. Continuation of Engineering Science 211. Mathematical topics include: functions of complex variables, operational and transform methods, numerical solutions of differential equations, finite differences, matrices.
- 217 *Analytical Mechanics* (3) Crafton
Fall—evening; spring—evening. Fundamental principles, generalized coordinates, variational principles and Lagrange's equations, nonholonomic systems, Hamilton's equations, theory of small oscillations.
- 218 *Mechanics of Orbits and Trajectories* (3) Crafton
1962-63 and alternate years: fall—evening. Celestial mechanics. Orbits and trajectories in force fields. Dynamics of space vehicles.
- 220 *Nonlinear Mechanics* (3) Crafton
Spring—evening. Topological and analytical methods in nonlinear mechanics, nonlinear resonance, relaxation oscillations.
- 221 *Theory of Elasticity I* (3) Arkilic
Fall—evening. Introduction to mathematical theory of elasticity, analysis of strain and stress, generalized Hooke's law, equilibrium equations, Beltrami-Michell equations, strain energy functions, torsion, general flexure.
- 222 *Theory of Elasticity II* (3) Arkilic
1962-63 and alternate years: spring—evening. Continuation of Engineering Science 221. First and second boundary-value problems in plane elasticity, uniqueness of solutions, simply and multiply connected regions, three-dimensional problems, thermoelasticity, vibration of elastic solids, variational methods.
- 223 *Celestial Mechanics* (3) Walther
Time to be arranged. General equations of motion; Lagrange's planetary equations; disturbing function; Delaunay and Poincaré variables; secular inequalities; lunar theory; precession and nutation.
- 227 *Experimental Stress Analysis* (3) Walther
Time to be arranged. Applications of the theory of elasticity in the analysis of strain and stress; theory of gaging for static and dynamic strain and stress measurements.
- 231 *Fluid Dynamics* (3) Ojalvo
Fall—evening. Theory of compressible and incompressible fluid motion including potential motion, circulation and vorticity, mathematical treatment of flow at sub-, trans-, and supersonic velocities, normal and oblique shock, and elements of heat transfer.
- 233 *Engineering Problems* (3) dePian
Spring—evening. Investigation of problems in engineering science, emphasizing imaginative and systematic application of fundamental principles in engineering, physics, and mathematics.

- 241 *Science of Engineering Materials* (3) Murdaugh
 1961-62 and alternate years: fall—evening. Relation of the atomic and microscopic structure of engineering materials to their physical and mechanical properties and their mechanical behavior in engineering applications.
- 251 *Magnetohydrodynamics* (3) Grisamore, Crafton
 Time to be arranged. Study of the interaction of electromagnetic and fluid fields. Dynamics of conducting fluids in electromagnetic and magnetic fields.
- 299-300 *Thesis* (3-3)
 Academic year—as arranged.

MECHANICAL ENGINEERING

FIRST GROUP

- 9 *Introduction to Engineering** (3) The Staff
 Fall—morning and evening; spring—evening. Number systems, computation aids, scientific method, problem solving techniques, use of mathematical tables. Emphasis is placed on the development of sound reasoning and study methods.
- 10 *Graphical Communication* (2) The Staff
 Fall—evening; spring—morning and evening. Spatial visualization, engineering drawing, schematic diagrams, descriptive geometry. A laboratory course. Laboratory fee, \$10.

SECOND GROUP

- 100 *Analytical Kinematics* (3) The Staff
 1961-62 and alternate years: spring—morning; 1962-63 and alternate years: spring—evening. Theoretical study of the motion of constrained and unconstrained rigid bodies. Prerequisite or concurrent registration: Civil Engineering 121, Mathematics 112.
- 113 *Thermodynamics I* (3) Ojalvo
 Fall—morning and evening. Theoretical study of fundamental concepts, equations of state, first and second laws of thermodynamics, entropy, single and two phase mixtures. Prerequisite: Chemistry 12, Mathematics 111, Physics 16.
- 114 *Thermodynamics II* (3) Dedrick
 Spring—late afternoon. Theoretical study of vapor cycles, combustion, gas dynamics, equilibrium, multiphase mixtures. Prerequisite: Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132, Mechanical Engineering 118.
- 118 *Heat Transfer* (3) Ojalvo
 Spring—morning and evening. Heat transfer theory, conduction, convection, radiation, field and potential theory applied to conduction. Prerequisite: Mathematics 112, Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132.
- 120 *Physical Metallurgy* (3) Murdaugh
 1961-62 and alternate years: spring—evening; 1962-63 and alternate years: spring—morning. Physics of metals, crystal and lattice structures, binary and ternary alloys, properties of alloys, nonequilibrium conditions, phase diagrams. Lecture and laboratory. Prerequisite: Civil Engineering 125, Mathematics 31. Laboratory fee, \$10.

* This course should be completed before the beginning of the sophomore year.

123 Advanced Dynamics I (3)

Crafton

1961-62 and alternate years: fall—morning; 1962-63 and alternate years: fall—evening. Shock and vibrations in linear mechanical systems, electromechanical analogies, transient and steady-state analysis. Prerequisite: Mechanical Engineering 100. Prerequisite or concurrent registration: Civil Engineering 157.

124 Advanced Dynamics II (3)

Crafton

1961-62 and alternate years: spring—morning; 1962-63 and alternate years: spring—evening. Advanced study of dynamics of continuous mechanical systems. Lagrange's equations, Hamilton's principle, gyrostatics. Prerequisite: Mechanical Engineering 123.

135-36 Thermal Power (3-3)

Ojalvo

1961-62 and alternate years: academic year—morning; 1962-63 and alternate years: academic year—evening. Analysis and design principles governing systems and components in heat power, gas and vapor turbines, internal combustion engines, heat pumps, nuclear power systems. Lecture and laboratory. Prerequisite: Civil Engineering 132; Mechanical Engineering 114, 118; Physics 191. Prerequisite or concurrent registration: Mechanical Engineering 139. Laboratory fee, \$15 a semester.

139 Fluid Machinery (3)

Mason

1961-62 and alternate years: fall—morning; 1962-63 and alternate years: fall—evening. Positive-displacement machines; hydraulic circuits and servo-mechanisms; general theory of dynamic machines; velocity diagrams and work transfer; radial, axial, and mixed-flow machines; torque converters and couplings; jet machines. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 113. Prerequisite or concurrent registration: Mechanical Engineering 123. Laboratory fee, \$10.

143 Production Analysis (3)

Kaye

1961-62 and alternate years: fall—evening; 1962-63 and alternate years: fall—morning. Principles of schematic models, mathematical programming, quality control, operations analysis. Prerequisite: Mathematics 112.

146 Dynamics of Compressible Fluids (3)

Dedrick

1961-62 and alternate years: spring—morning; 1962-63 and alternate years: spring—evening. Mathematical theory of compressible fluid flow, flow around immersed bodies, airfoil theory, shock-wave theory, thermodynamics of compressible fluids. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 113. Laboratory fee, \$10.

195-96 Special Topics in Mechanical Engineering (arr.)

Academic year—as arranged. Special problems approved by the Staff. May be substituted for required senior courses. Prerequisite: senior status and approval of the instructor.

THIRD GROUP

211 Thermodynamics (3)

Ojalvo

Fall—evening. Reversible and irreversible processes, equilibrium, ideal and van der Waal's gases, dilute solutions, phase equilibria, electric and magnetic effects, radiation. Introduction to kinetic theory and statistical mechanics.

213 Heat Transfer (3)

Ojalvo

Spring—evening. Physical and mathematical concepts of heat transfer phenomena under steady and unsteady conditions, including: Stefan-Boltzmann and Planck laws for radiation, Fourier heat equation for conduction, dimensional analysis, and boundary layer theory for convection.

215 Gas Dynamics (3)

Ojalvo

Spring—evening. Theory of gas dynamics including: combustion, shock phenomena, dynamics of flow, and heat transfer for high temperature gases.

235 Hypersonic Fluid Dynamics (3)

Crafton

To be arranged. Small disturbance theory; Newtonian theory; constant-density solutions; thin shock layers; viscous interactions; free molecule and rarefied gas flows.

255 Combustion Processes (3)

Dedrick

Time to be arranged. Thermodynamics of combustion; chemical kinetics; flame propagation; combustion of liquids and solids; detonation processes.

256 Reaction Kinetics (3)

Dedrick

Time to be arranged. Theoretical aspects of kinetics of homogeneous and heterogeneous reactions in gaseous and liquid systems.

METROLOGY

The courses listed below will be offered as required by the degree programs in the Center for Measurement Science. Additional courses will be made available as facilities and needs dictate. For detailed information concerning courses to be offered and hours of classes, see the Schedule of Classes which is available in the Registrar's Office in advance of each semester. NBS in parentheses indicates courses which will be taught at the National Bureau of Standards.

FIRST GROUP**1 Foundations of Metrology (3)**

McNish

Origin and development of standards, relative and absolute measurements, systematic and random errors, comparison and dissemination of standards; effective design of experiments; translation of standards to manufacturing. Prerequisite: Mathematics 31, Physics 14.

2 Measurements Laboratory I (3) (NBS)

McNish

Use of standard devices for measurement of length, time, speed, force, weight, mass, density, specific gravity; calibrations. Prerequisite or concurrent registration: Metrology 1.

3 Measurements Laboratory II (3)

McNish

Fluid flow and electrical measurements; measurements involving use of several instruments. Prerequisite: Metrology 2.

4 Introduction to Statistics for Metrology (3)

Measurement—qualitative and quantitative aspects. The role of corrections. Measurement as a production process. Errors, limiting mean, true value, precision, and accuracy. Classification of errors; statistical tools for the detection and diagnosis of errors. Quality control of measurement processes. Measurement of the precision and assessment of the accuracy of a measurement process. Expression of the uncertainties affecting a measured value. Prerequisite: Mathematics 31, and a laboratory course in physical science or engineering.

SECOND GROUP**111-12 Precise Electrical Measurements I-II (3-3) (NBS)**

Harris

Electrical measurements from direct current through radio frequencies. Units and dimensional systems; techniques of substitution and comparison; transfer techniques; ratio techniques; detectors; bridges; measurement of current, voltage, power, resistance, capacitance, inductance, energy, phase angle, frequency, and time; dielectric and magnetic measurements; special topics in high-frequency measurements; field strength, signal-to-noise ratio, impedance, attenuation. Prerequisite: Electrical Engineering 102, 104, and Mathematics 111, or the equivalent.

113 Introduction to Transducers and Instrumentation (2)

Rubin

Theory and application of simple transducers; techniques in instrumentation of systems of one type (electrical, electronic, fluid, mechanical, optical, acoustical, nuclear); analysis and design of simple instrumentation systems, with emphasis on the precision and accuracy of measurement. Prerequisite: Electrical Engineering 102, Mathematics 111, Metrology 3, or the equivalent.

114 Advanced Transducers and Instrumentation (3)

Rubin

Advanced study of practical transducers and instrumentation; theory and applications of advanced transducers in instrumentation problems involving measurements on sys-

tems containing multiple quantities of one type or mixture of types (such as electrical, electrical-electronic, fluid, fluid-mechanical-acoustical, etc.), with emphasis on optimum instrumentation for precision measurement. Prerequisite: Metrology 113 or graduate status.

121 *Precise Mechanical Measurements* (4) (NBS)

Measurements of mass, time, weight; visual, mechanical, length, and interferometric methods; density, force, pressure, vibration, acceleration, flow, and viscosity measurements. Prerequisite: Metrology 1, 4, or the equivalent.

131 *Precise Heat Measurements* (4) (NBS)

Temperature measurement, the thermodynamic and international temperature scales, resistance thermometry, thermocouples, and pyrometry. Vapor pressure thermometry and other techniques for low-temperature measurement. Heat transfer quantities and their measurement, conduction, convection, and radiation. Calorimetry; isothermal and adiabatic calorimeters, flow calorimeters; types of heat quantities measured by calorimetry. Prerequisite: Metrology 1, 4, or the equivalent.

Guilmer

THIRD GROUP

201 *Advanced General Metrology* (3)

203-4 *Probability and Statistics of Metrology I-II* (3-3)

Probability distributions, discrete and continuous distributions; sampling; combinatorial analysis; stochastic processes; conditional probability; correlation; analysis of variance; design and analysis of experiments, Latin Square experiments, factorial experiments, block and lattice designs. Prerequisite: Metrology 4 or the equivalent and graduate status.

214 *Microwave Measurements* (3)

Measurement of power, frequency, impedance, wavelength, and attenuation at microwave frequencies. Characteristics and Q of resonant devices. Prerequisite: Electrical Engineering 104 or the equivalent and graduate status.

Sorger

220 *Precise Optical Measurements* (3)

Optical constants of lens systems; aberration; resolving power; illumination in focal plane; image evaluation, magnification, index of refraction; color and color temperature.

299-300 *Thesis* (3-3)

ENGLISH*

Professors E. S. Shepard†, F. S. Tupper, C. D. Linton, C. W. Cole (*Executive Officer*), R. H. Moore, J. H. Coberly

Associate Professors W. L. Turner, Muriel McClanahan, P. H. Highfill, Jr., J. G. Allee, Jr.‡, J. P. Reesing, Jr., R. H. Walker, Jr.

Assistant Professors R. E. Gajdusek, Elizabeth Wright, Nancy Tischler, G. A. Santangelo, J. G. Sweeney

Instructors Jane Bauman, R. C. Rutledge

Bachelor of Arts with a major in American Thought and Civilization (Columbia College—Field-of-Study).—Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51-52.

Required: the general requirements of Columbia College as stated on pages 61-65 and the grade "pass" on the American Thought and Civilization major examination at the end

* The Staff of Instruction here listed is for the academic year 1960-61.

† On sabbatical leave fall semester 1960-61.

‡ On sabbatical leave summer 1961.

of the senior year. The coordinated field of knowledge upon which the student will be examined is summarized under four general headings: (1) European cultural history—the Renaissance and modern social and intellectual cultures as a background to contemporary civilization with particular attention to English literature and history from the 16th through the 19th centuries; (2) American history—the political, economic, social, and religious thought and experience of the American people; (3) American philosophy and fine arts—a survey of periods and movements with a knowledge of outstanding individuals; (4) American literature—a knowledge of major writers, together with a study of poetry, fiction, and drama. The Department of English provides a proseminar (English 179-80) intended to assist the student in preparing himself for the major examination. The major adviser will give to each student at registration a check list of available courses grouped as prerequisite, necessary, or desirable for the completion of the major study program.

Bachelor of Arts with a major in English Literature (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters curriculum in the Junior College described on pages 51-52. It is recommended that prospective majors elect English 91-92 from among the listed offerings.

Required: the general requirements of Columbian College as stated on pages 61-65, and the passing of the English Literature major examination at the end of the senior year. The field of coordinated knowledge upon which the student will be examined at the end of his senior year is summarized under the following general headings: (1) the history of English literature from the Anglo-Saxon period; (2) the chief English writers (a certain familiarity with each man and his main works and a detailed knowledge of Shakespeare); (3) English social and political history as it bears upon or is reflected in the literature; (4) European intellectual backgrounds and movements which have affected English literature. The proportion of work taken in each of these areas should be worked out by the student in consultation with one of the English Literature advisers. The Department of English provides a proseminar (English 199-200) to assist the student in preparing himself for the major examination. A detailed description of the major is available in the Office of the Dean of Columbian College.

Master of Arts in the field of American Literary and Cultural History (Columbian College).—Prerequisite: the equivalent of an undergraduate major in this University in (1) History (with American history as a major part), (2) American Thought and Civilization, or (3) English Literature (with introductory courses in American literature and American history). The student who has not taken any of the above majors at this University must take a candidacy examination.

Required: in addition to the general requirements of Columbian College as stated on pages 66-69, the following specific requirements must be met: twelve of the required semester hours must be of seminar study, six in American history and six in American literature; twelve of the required semester hours must be of second and third group courses in the fields of American history, literature, philosophy, education, and art recommended by the adviser; a thesis (six semester hours) in any of the foregoing fields or in some combination of them. Because of the various undergraduate majors which will be accepted for admission to this program, a basic reading list is assigned to all students, to assist in preparing them for the final Master's examination.

Master of Arts in the field of English and American Literature (Columbian College).—Prerequisite: an undergraduate major in English Literature or American Thought and Civilization at this University; or twenty-four semester hours in English and/or American literature above the sophomore level. The student who has not taken either of the above majors at this University must take a candidacy examination. The student offering split preparation (English and American literature) will be examined in English and American literature.

Required: in addition to the general requirements of Columbian College as stated on pages 66-69, the following specific requirements must be met: (1) a schedule of courses amounting to twenty-four semester hours, planned in consultation with the adviser; on the basis of the student's undergraduate preparation, to include a comprehensive survey of American literature and of English literature from 1600; (2) a Master's thesis (six semester hours) written upon an approved topic under the direction of the instructor in whose field the major portion of the material falls; (3) a final written examination on American literature and on English literature from 1600.

Master of Arts in the field of English Literature (Columbian College).—Prerequisite: an undergraduate major in English Literature at this University, or twenty-four semester hours in English literature above the sophomore level. The student who has not passed the

major examination in English at this University must take a candidacy examination which, in its scope and difficulty, is comparable to the major examination in English.

Required: in addition to the general requirements of Columbian College as stated on pages 66-69, the following specific requirements must be met: (1) a schedule of courses amounting to twenty-four semester hours, planned in consultation with the adviser; (2) a Master's thesis (six semester hours) written upon an approved topic under the direction of the instructor in whose field the material falls; and (3) a final written examination.

Doctor of Philosophy (Graduate Council).—See page 72.

Bachelor of Arts in Education with a teaching field in English (School of Education).—Prerequisite: the Education curriculum, pages 53-54.

Required: the English option and the professional courses listed in the School of Education Catalogue.

ENGLISH COMPOSITION*

FIRST GROUP

A *English for Foreign Students* (3)

Allee and Staff

Fall—morning, afternoon, and evening; spring—morning and evening; summer 1961.

A course in reading and writing designed to assist the foreign student in overcoming deficiencies in the use of English. Special attention is given to spelling, syntax, grammar, idiom, and vocabulary.

B *English for Foreign Students* (3)

Allee and Staff

Fall—evening; spring—morning and evening. For second-semester foreign students not yet ready for English 1. Writing of expository paragraphs and themes; outlining; reading for comprehension, vocabulary, and style.

1 *English Composition** (3)

Moore and Staff

Fall—morning, afternoon, and evening; spring—morning, afternoon, and evening; summer 1961. Review of grammar, exercises in composition, readings.

1X *English Composition** (3)

Moore and Staff

Fall—morning, afternoon, and evening; spring—morning, afternoon, and evening; summer 1961. An intensive course in English grammar and composition to which are assigned students whose placement tests show them inadequately prepared for the regular work of English 1. The course begins with detailed instruction, drill, and exercises in the basic structure of the English language and in the writing of paragraphs; it continues with the content of English 1. English 1X meets five hours a week and carries 3 semester hours of credit. The tuition fee is \$115 (the regular fee of \$30 a semester hour, plus an additional fee of \$25).

2 *English Composition** (3)

Moore and Staff

Fall—morning and evening; spring—morning, afternoon, and evening; summer 1961. For second-semester freshmen not following the pre-Columbian College curricula. Readings and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X.

4 *English Composition** (3)

Moore and Staff

Fall—morning and evening; spring—morning and evening; summer 1961. The second half of the six-hour English Composition course required of students in the pre-Columbian College curricula. A course in critical analysis and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X and both semesters of one of the introductory literature courses.

* Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared are assigned to English 1X.

All pre-Columbian College students (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1 or 1X, both semesters of one of the introductory literature courses, and English 4.

English 1 or 1X is prerequisite to all other courses in English. English 2 is the second half of the six-hour composition course requirement of students not required to follow the pre-Columbian College sequence.

11 The Writing of Reports (3)

Turner and Staff

Fall—morning and evening; spring—morning and evening; summer 1961. Theory and practice in the writing of technical reports. Prerequisite: English 1 or 1X, and 2 or 4.

SECOND GROUP**109 Expository Writing (3)**

McClanahan and Staff

Fall—evening. A study of types of expository writing with weekly exercises. Prerequisite: English 1 or 1X, and 2 or 4.

113 Narrative Writing (3)

Fall—evening. Study of the techniques of narrative writing and class criticism of student writing. Prerequisite: English 1 or 1X, and 2 or 4.

114 The Writing of Fiction—the Short Story (3)

Spring—evening. Prerequisite: English 113; consent of instructor.

116 Advanced Exposition (3)

Moore

Spring—evening. Theory and practice in the writing of expository articles and essays. Prerequisite: English 109; consent of instructor.

117-18 The Writing of Fiction—the Novel (3-3)

Academic year—evening. Writing a novel. Prerequisite: English 114; consent of instructor.

ENGLISH LITERATURE**FIRST GROUP****51-52 Introduction to English Literature* (3-3)**

Tupper and Staff

Academic year—morning, afternoon, and evening; summer 1961. A historical survey. Prerequisite: English 1 or 1X.

91-92 Introduction to European Literature* (3-3)

Shepard and Staff

Academic year—morning and evening. Consideration of various types. Prerequisite: English 1 or 1X.

SECOND GROUP***121-22 English Literature from the Beginnings to 1500 (3-3)**

Allee

Academic year—morning. First half: English literature prior to Chaucer. Second half: Chaucer.

125 Introduction to English Linguistics (3)

Allee

Spring—evening. The development of the English language in a historical treatment of English grammar.

129-30 Elizabethan Nondramatic Literature (3-3)

Tupper

Not offered 1961-62. Nondramatic literature from 1485 to 1601.

135-36 Shakespeare (3-3)

Tupper

Academic year—evening; summer 1961—English 136 (3).

139-40 The Seventeenth Century (3-3)

Reesing

Not offered 1961-62. First half: poetry and prose from 1603 to 1660. Second half: Milton.

141-42 The Neoclassical Movement (3-3)

Highfill

Academic year—evening. Poetry and prose from 1660 through the mid-18th century.

* All pre-Columbian College students (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1 or 1X, both semesters of one of the introductory literature courses, and English 4.
English 51-52, 71-72, 91-92, Classical Languages 71-72, French 51-52, German 51-52, Slavic Languages 91-92, or Spanish 51-52 is prerequisite to all second-group courses except English 125.

- 151-52 *The Romantic Movement* (3-3) Reesing
Academic year—morning. From the mid-18th century through Shelley and Keats.
- 161-62 *Victorian Literature* (3-3) Shepard
Academic year—evening; summer 1961—English 162 (3). Poetry and prose from 1830 to 1900.
- 165-66 *The Twentieth Century* (3-3) Linton
Academic year—morning; summer 1961—English 165 (3). British poetry, prose, and drama since 1900.
- 181-82 *The English Novel* (3-3) Reesing
Academic year—morning. Major English novelists from the 18th century to the present day.
- 183-84 *The English Drama* (3-3) Highfill
Academic year—morning; summer 1961—English 184 (3). *First half:* concerned principally with the drama of Shakespeare's contemporaries. *Second half:* a historical survey from 1660 to the present day.
- 192 *Medieval Legend and Saga* (3) Allee
Not offered 1961-62. Celtic and Norse.
- 199-200 *Proseminar: Readings for the English Literature Major* (3-3) Tupper, Highfill
Academic year—afternoon and evening. Conferences and group discussions.
- THIRD GROUP
- 222 *The Age of Chaucer* (3) Allee
Not offered 1961-62.
- 223-24 *Old English* (3-3) Allee
Not offered 1961-62. English language and literature before 1100. *First half:* Old English grammar and readings. *Second half:* Beowulf.
- 225 *Applied Linguistics* (3) Allee
Not offered 1961-62. Survey of the English language since 1850; introduction to analytical methods of structural linguistics and their application to modern American and British writing and to secondary school teaching of English.
- 235-36 *Studies in Shakespeare and His Contemporaries* (3-3) Tupper
Academic year—evening. Prerequisite: English 135-36.
- 239-40 *Studies in Seventeenth Century Literature* (3-3) Reesing
Academic year—evening. Open to qualified undergraduates. *First half:* chief figures exclusive of Milton. *Second half:* Milton.
- 241-42 *Studies in Neoclassical Literature* (3-3) Highfill
Not offered 1961-62. Prerequisite: English 141-42.
- 251-52 *Studies in the Romantic Movement* (3-3) Reesing
Academic year—evening. Prerequisite: English 151-52.
- 261-62 *Studies in Victorian Literature* (3-3) Shepard
Not offered 1961-62. Prerequisite: English 161-62.
- 265-66 *Studies in Twentieth Century Literature* (3-3) Linton
Not offered 1961-62. Eliot and his contemporaries.
- 295-96 *Studies in the History of English Literary Criticism* (3-3) Shepard
Summer 1961—English 295 (3). Open to undergraduates with the approval of the instructor.
- 299-300 *Thesis* (3-3) The Staff

AMERICAN LITERATURE

FIRST GROUP

- 71-72 *Introduction to American Literature** (3-3) Cole and Staff
 Academic year—morning, afternoon, and evening; summer 1961. A historical survey.
First half: from the beginnings to the Civil War. *Second half:* from the Civil War to the present. Prerequisite: English 1 or 1X.

SECOND GROUP*

- 170 *The American Short Story* (3) Coberly
 Summer 1961. The historical development of the short story in America.
- 171-72 *Studies in American Literature* (3-3) Walker
 1961-62 and alternate years: academic year—evening; 1962-63 and alternate years: academic year—morning. Major factors in the national cultural tradition as shown by outstanding writers. Prerequisite: English 51-52 or 71-72.
- 173-74 *Major American Poets* (3-3) Coberly
 1961-62 and alternate years: academic year—evening; 1962-63 and alternate years: academic year—morning; summer 1961—English 174 (3). Advanced critical study of significant writers and movements. *First half:* from beginnings through 19th century. *Second half:* the 20th century.
- 175-76 *American Drama* (3-3) Cole
 1961-62 and alternate years: academic year—morning; 1962-63 and alternate years: academic year—evening; summer 1961—English 176 (3). Historical and critical study of significant plays and forms. *First Half:* from beginnings through 19th century. *Second half:* the 20th century.
- 177-78 *American Fiction* (3-3) Coberly
 1961-62 and alternate years: academic year—afternoon; 1962-63 and alternate years: academic year—evening. Historical and critical study of significant novels and short stories. *First half:* from beginnings through 19th century. *Second half:* the 20th century.
- 179-80 *Proseminar: Readings for American Thought and Civilization Majors* (3-3) The Staff
 Academic year—afternoon and evening. Conferences and group discussions.

THIRD GROUP

- 271-72 *Seminar in American Thought* (3-3) Walker
 Academic year—evening. Intensive consideration of specific periods and themes, primarily literary, in the history of American civilization. Prerequisite: English 171-72 or the equivalent.
- 277-78 *Studies in American Fiction* (3-3) Coberly
 Not offered 1961-62. Prerequisite: English 177-78 or the equivalent. Open to the undergraduate with the approval of the instructor.
- 279-80 *Thesis* (3-3) The Staff

RELATED COURSES IN OTHER DEPARTMENTS

- Education 136, *Teaching English*
 History 151-52, *English History*
 Philosophy 111-12, *History of Philosophy*
 Speech B, *American Speech for Foreign Students*
 Speech 102, *Oral Interpretation of Literature*

* All pre-Columbian College students (who are required to take one year of English composition and one year of literature in English, Classical Languages, French, German, Slavic Languages, or Spanish) will follow the sequence of English 1 or 1X, both semesters of one of the introductory literature courses, English 4.
 English 51-52, 71-72, 91-92, Classical Languages 71-72, French 51-52, German 51-52, Slavic Languages 91-92, or Spanish 51-52 is prerequisite to all second-group courses except English 171-72.

GEOGRAPHY*

Professor R. D. Campbell (Executive Officer)
Professorial Lecturers Eric Fischer, S. R. Abrahamson
Associate Professor H. W. Westermann
Assistant Professor J. T. Davis
Lecturer J. P. Pickard

Bachelor of Arts with a major in Geography (Columbian College—Departmental).
 Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51-52. It is strongly recommended that this curriculum include: Botany 1-2; Economics 1, 2; Geology 1-2; and Sociology and Anthropology 1-2. Electives must include Geography 51 and 52.

Required: in addition to the general requirements of Columbian College as stated on pages 61-65, twenty-four semester hours of Geography beyond first-group courses, including Geography 103-4, 115-16; fifteen semester hours in one or more of the following departments: Botany, Economics, Geology, History, Political Science, Sociology and Anthropology; and six semester hours of Mathematics or Statistics.

Master of Arts in the field of Geography (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in Geography from this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 66-69. The thirty hours of required work must include Geography 201-2, 205-6, and 299-300.

Bachelor of Science in Cartography (College of General Studies).—See pages 228-29, "Courses Offered in Special Programs," and the College of General Studies Catalogue for complete details.

Bachelor of Arts in Education with a teaching field in Geography (School of Education).
 —Prerequisite: the Education curriculum, pages 53-54.

Required: the Geography option and the professional courses listed in the School of Education Catalogue.

Doctor of Philosophy (Graduate Council).—See page 73.

FIRST GROUP

51 *Introduction to Geography* (3)

Fall—morning; spring—evening; summer 1961. A study of place attributes and characteristics, patterns and associations of physical and cultural earth features. The Staff

52 *World Regions* (3)

Fall—evening; spring—morning; summer 1961. The analysis of world regional divisions, description and interpretation of region complexes, evaluation of regional differences as they affect the distribution and activities of man. The Staff

SECOND GROUP

103-4 *Cartography* (3-3)

A year course: credit is not given for the first half until the second half is completed. Academic year—Saturday morning. Principles of cartographic drafting; elementary map projections; map and graph planning, design and construction; uses and interpretation of maps. Prerequisite: Geography 51 and 52. Laboratory fee, \$11 a semester. Westermann

115-16 *Physical Geography* (3-3)

Academic year: lecture (2 hours), laboratory and field trip (2 hours)—evening and Saturday afternoon. Introduction to the earth sciences: form of the earth, grids and time, weather and climate, geomorphic processes and land-forms, soils, vegetation; weather forecasting, map reading. Davis

124 *Land Capabilities* (3)

1961-62 and alternate years: fall—morning. Evaluation of land capabilities based on analysis of locational, physical, economic, and social land characteristics. Principles of site analysis and best use. Systems of measurement of area potential. Davis

* The Staff of Instruction here listed is for the academic year 1960-61.

- 125 *Transportation Complexes* (3) Davis
1961-62 and alternate years: spring—morning. A study of transportation networks and systems by which people, things, and ideas are given varying degrees of place utility. An analysis of the role of transportation in urban, national, and international relationships.
- 126 *World Food Supply* (3)
1962-63 and alternate years. World patterns of production and consumption of food stuffs, commercial and subsistence agriculture. World capabilities for feeding the world's population.
- 127 *World Population and Settlement* (3)
1962-63 and alternate years. Population composition, structures, and distribution; characteristic world settlement patterns in terms of population organization. Assessment of factors contributing to population pressures, explosions and migrations, urban and rural settlement patterns and trends.
- 133 *Regional Industrial Structures* (3)
1962-63 and alternate years. The nature of the industrial complex, types and distribution of industry, principles of industrial and economic development planning.
- 134 *Location of Industry* (3)
1962-63 and alternate years. Structure and development of the major world industries, industrial location requirements, principles of industrial equilibrium.
- 141-42 *Urban Settlement* (3-3) Westermann
1961-62 and alternate years: academic year—evening. Location, functions, and forms of cities; urban-rural relationships; the urban hierarchy; bases for urban planning.
- 143 *Designs for Tomorrow's Cities* (3) Westermann
Summer 1961. Theories of city functions and structures; analysis of contemporary urban problems; development of optimum designs for future cities.
- 145 *World Cultural Geography* (3) Campbell
Fall—morning. A study of differences in national character structures; modal behavior patterns and personality traits typical of various cultures; difficulties these differences present in interpersonal relations and intercultural communications.
- 146 *World Political Geography* (3) Campbell
Spring—morning. Types and distributions of political systems, the major political units and associations of the world, factors which affect relative political power, areas of conflict and arbitration.
- 165 *Regional Intelligence* (3) Campbell
Not offered 1961-62.
- 172 *Field Studies in Physical and Social Geography* (3) Davis
Summer 1961. A series of field trips designed to demonstrate geographic field techniques and afford a representative cross-section of field study opportunities in the Washington, D. C., area. Transportation fee: \$20.
- 181 *United States** (3)
Not offered 1961-62.
- 183 *Western Europe** (3)
1962-63 and alternate years.
- 184 *The Mediterranean** (3)
1962-63 and alternate years.

* Regional survey. No prerequisites. For students particularly interested in the study of specific regions, regional courses in the departments of Economics, History, and Political Science are strongly recommended, for example: Economics 185-86, *Economic History and Problems of Latin America*, History 164, *South America since Independence*; and Political Science 177, *Recent Trends in Latin American Politics and Government*.

- 185 *Africa** (3) Westermann
Spring—morning.
- 186 *The Middle East** (3) Davis
Fall—afternoon.
- 191 *Latin America** (3) Westermann
1961-62 and alternate years: fall—morning.
- 195 *Eastern and Southeastern Asia** (3) Davis
Spring—afternoon.
- 196 *The Soviet Union** (3)
1962-63 and alternate years.
- 197 *The Pacific** (3)
Not offered 1961-62.
- 198 *Australia** (3)
Not offered 1961-62.

THIRD GROUP†

- 201-2 *Seminar: History and Philosophy of Geography* (3-3)
A year course: credit is not given for the first half until the second half is completed. 1962-63 and alternate years. A study of the development of geographic thought, from Herodotus to the present; a critical appraisal of the great works of the world's most famous geographers; an attempt to develop a useful, contemporary philosophy of geography.
- 205-6 *Area Data Collection and Analysis* (3-3) Davis
A year course: credit is not given for the first half until the second half is completed. Lecture (1 hour), laboratory and field (3 hours). 1961-62 and alternate years; academic year—evening. Sources of regional information; methods and systems of data collection; quantitative and qualitative methods of analysis; systems of synthesis.
- 211-12 *Reading Course in Economic Geography* (3-3)
1962-63 and alternate years. The development of economic geography as a systematic approach to regional analysis, the literature of economic geography, research methods.
- 233-34 *Seminar: Regional and Urban Planning* (3-3)
1962-63 and alternate years. Analysis of the planning function, major problems confronting the planner, contemporary status of planning—its areas of success and failure.
- 241-42 *Seminar: Place and Culture* (3-3) Campbell
Academic year—evening. A study of the culture traits which characterize various ethnic groups and differentiate people-place associations.
- 251-52 *Seminar: World Problem Areas* (3-3)
Not offered 1961-62. A study of those parts of the world which have become matters of international concern, whether because of their political or social instability, unsound economic development, or aggressive tendencies. An evaluation of the complex of factors which have created the "problems".
- 295-96 *Research* (3-3) The Staff
Academic year—as arranged. Special directed studies.
- 299-300 *Thesis* (3-3) The Staff

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above, the University offers the following courses for students undertaking work toward the degree of Bachelor of Science in Cartography, which is administered by the College of General Studies.

* See footnote on page 227.

† Senior major or graduate status is required in all third-group courses.

For information concerning the degree in Cartography, see the brochure on the subject.

CARTOGRAPHY PROGRAM

Geography

- 113 *Geomorphology* (3)
- 114 *Weather and Climate* (3)
- 132 *Land Use* (3)
- 176 *Photo Geography* (3)

Cartography

- 1 *Map Interpretation* (3)
- 2 *Photo Interpretation* (3)
- 11 *Cartographic Drafting and Descriptive Geometry* (3)
- 12 *Topographic Surveying* (3)
- 13 *Higher Surveying* (3)
- 17-18 *Elementary Photogrammetry* (3-3)
- 110 *Map Projections* (2)
- 111 *Map Reproductions* (1)
- 155 *Elementary Geodesy* (3)
- 156 *Geodetic Astronomy* (3)
- 191-92 *Map and Chart Construction* (3-3)

GEOLOGY*

Professor Geza Teleki (*Executive Officer*)

Professorial Lecturers C. L. Christ, Michael Fleischer, H. T. Evans, Jr.

Associate Professorial Lecturers Nicholas Hotton, I. G. Sohn, D. E. Appleman

Assistant Professor Percy Crosby

Lecturers Irving Friedman, E. R. Hilton

Bachelor of Arts or Bachelor of Science with major in Geology (Columbia College—Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, pages 51 and 52. The following first-group courses must be included: Geology 1-2, 12, 51; Chemistry 11-12; Physics 11, 12; Biology 1-2 or Botany 1-2 or Zoology 1-2.

Required: in addition to the general requirements of Columbia College as stated on pages 61-65, twenty-four semester hours in Geology beyond first-group courses for the Bachelor of Arts degree, thirty for the Bachelor of Science degree.

Master of Arts or Master of Science in the field of Geology (Columbia College).—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Geology from this University, or the equivalent.

Required: the general requirements of Columbia College, as stated on pages 66-69. For graduate work, the foreign language studied should be French, German, or Russian.

* The Staff of Instruction here listed is for the academic year 1960-61.

FIRST GROUP

1-2 *Introductory Geology* (3-3)

The Staff

Academic year: lecture (2 hours), laboratory and field trip (2 hours)—morning and afternoon. A survey course covering the principles of geology. *First half*: physical geology—materials of the earth's crust, geologic processes. *Second half*: historical geology, geological periods, evolution of life on earth. Laboratory fee, \$5 a semester.

12 *Minerals and Rocks* (3)

Fall: lecture (2 hours), laboratory (3 hours)—morning. Elementary crystallography; identification and classification of minerals and rocks; determinative mineralogy. Prerequisite: Geology 1-2 or permission of the instructor. Laboratory fee, \$5.

51 *Introductory Paleontology and Stratigraphy* (3)

The Staff

Spring: lecture (2 hours), laboratory (2 hours)—morning. Survey of paleontology and stratigraphy, taxonomy of fossil plants and animals, stratigraphic paleontology, principles of sedimentation and correlation. Prerequisite: Geology 1-2 or permission of the instructor. Laboratory fee, \$5.

SECOND GROUP

101 *History of Geological Sciences* (2)

Teleki

Fall—evening. Lectures on the development of geological thought and the history of geological and related sciences.

111-12 *Mineralogy* (3-3)

A year course: credit is not given for the first half until the second half is completed. Academic year: lecture (2 hours), laboratory (3 hours)—morning and afternoon. *First half*: morphological crystallography, elements of crystal chemistry, structural basis for classification of minerals with special emphasis on the silicates. *Second half*: optical mineralogy, study of minerals with polarizing microscope. Prerequisite: Geology 1-2, Chemistry 11-12, Physics 11 and 12. Laboratory fee, \$10 a semester.

115 *Petrology* (4)

Fall: lecture (2 hours), laboratory (4 hours)—evening. Introduction to the principles of heterogeneous equilibrium and phase rule, interpretation of phase diagrams, petrogenesis, classification and description of rocks using the polarization microscope. Prerequisite: Geology 111-12; Chemistry 111-12, recommended. Laboratory fee, \$15.

122 *Structural Geology* (3)

Spring: lecture (2 hours), laboratory and field trips as arranged—morning. Interpretation of geologic formations on the basis of their structures and genesis. Principles of mega- and micro-tectonics. Prerequisite: Geology 1-2, Physics 11 and 12.

128 *Geomorphology* (3)

Spring: lecture (2 hours), laboratory and field trips as arranged—afternoon. and evolution of earth forms, interpretation of maps and aerial photographs. Prerequisite: Geology 1-2 or Geography 115-16.

132 *Economic Geology* (3)

1962-63 and alternate years: lecture (3 hours), laboratory and field as arranged. Genesis, distribution, mode of occurrence, and utilization of mineral raw materials. Mining industry in relation to economic life. Laboratory fee, \$10.

151-52 *Invertebrate Paleontology* (3-3)

Teleki

Academic year: lecture (2 hours), laboratory (3 hours), field trips as arranged—morning. Taxonomy of fossil invertebrates, development of phyla, paleoecology of invertebrate organisms. One or two phyla a semester; does not repeat itself and may be reelected for credit. Prerequisite: Geology 1-2, 51; Biology 1-2 or Zoology 1-2. Laboratory fee, \$8 a semester.

154 Vertebrate Paleontology (3)

Hotton

1962-63 and alternate years: lecture (2 hours), laboratory or field as arranged.
General features of vertebrate morphology and evolution as illustrated by the fossil record; problems of paleoecology and adaptation, where appropriate.

166 Stratigraphy (4)

Teleki

1961-62 and alternate years: spring—afternoon. Sedimentation, facies, evaluation of stratigraphic boundaries, principles of correlation, applied stratigraphic geology.
Prerequisite: Geology 1-2, 51.

173 Regional Geology (3)

1961-62 and alternate years: fall—afternoon. Topic: North America. Lecture and map work on the regional distribution of geological formations and structures. This course may be reelected for credit. Prerequisite: Geology 1-2, Geography 51, or permission of the instructor.

174 World Regional Geology (3)

Teleki

1962-63 and alternate years. Lecture and map work on the regional distribution of geological formations of the world, with special emphasis on geotectonics and paleogeography. Prerequisite: Geology 1-2, Geography 51, or permission of instructor.

THIRD GROUP

205-6 Seminar (3-3)

The Staff

Academic year—as arranged.
elected in successive years.

Special topics. Does not repeat itself and may be

211 X-ray Crystallography (3)

Christ

Not offered 1961-62.

The structure of crystals as determined by the X-ray method.

212 Crystal Chemistry* (3)

Evans

1962-63 and alternate years.

Chemistry of the solid state. Bonding and coordination and the role of crystalline structure in chemistry and mineralogy.

241 Geochemistry* (3)

Fleischer

1961-62 and alternate years: fall—evening.

Principles and theories on the abundance, relationships, and the distribution in the various rock and mineral species.

244 Isotope Geology* (3)

Friedman

1961-62 and alternate years: spring—evening.

Investigation of geological phenomena by means of stable and unstable isotopes of elements and of changes in their abundance.

251-52 Micropaleontology (4-4)

Sohn

Lecture (2 hours), laboratory as arranged.

1961-62 and alternate years: academic year—evening. Identification with the binocular microscope of Ostracoda and other fossil micro-organisms. Micropaleontological techniques, paleontological research methods, taxonomy, and paleoecology. Age determination and correlation of stratigraphic units. Laboratory fee, \$12 a semester.

299-300 Thesis (3-3)

The Staff

Academic year—as arranged.

* Prerequisite: an adequate background in physics and chemistry, to be determined in conference with the instructor.

GERMANIC LANGUAGES AND LITERATURES*

Professors W. K. Legner (*Executive Officer*), Gretchen Rogers
Associate Professor J. C. King
Assistant Professor H. D. Osterle

Bachelor of Arts with a major in Germanic Languages and Literatures (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51–52.

Required: in addition to the general requirements of Columbian College as stated on pages 61–65. German 51–52 plus eighteen semester hours in German courses, above the first group; reasonable proficiency in speaking and writing German; History 39–40 or the equivalent; six semester hours in Philosophy selected with the approval of the adviser. Majors in German are strongly advised to study French.

Master of Arts in Germanic Languages and Literatures (Columbian College).—Prerequisite: a Bachelor of Arts degree with a major in Germanic Languages and Literatures from this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 66–69; a reading knowledge of French. The thirty hours of required work must include a thesis in the field of German literature or linguistics.

Doctor of Philosophy (Graduate Council).—See page 72.

Bachelor of Arts in Education with a teaching field in German (School of Education).—Prerequisite: the Education curriculum, pages 53–54.

Required: the German option and the professional courses listed in the School of Education Catalogue.

FIRST GROUP

1–2 *First-year German* (3–3)

The Staff

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—morning and evening; spring—morning; summer 1961. *Second half:* fall—morning; spring—morning and evening; summer 1961. The essentials of German grammar; translation of easy prose. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester.

3–4 *Second-year German* (3–3)

The Staff

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—morning and evening; spring—morning; summer 1961. *Second half:* fall—morning; spring—morning and evening; summer 1961. Selections from modern German prose; continuation and review of grammar. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester. Prerequisite: German 1–2 or two years of high school German.

9–10 *German Conversation and Composition* (3–3)

Rogers

Academic year—morning. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester.

47 *Beginning German for Reading Examination Candidates* (0)

The Staff

Fall—evening; spring—evening; summer 1961. Specifically for graduate students with little or no German, who are preparing for reading examinations. No academic credit. Tuition fee, \$90.

49 *German Readings for Nonmajor Students* (3)

The Staff

Fall—evening; spring—evening; summer 1961. Primarily for graduate students preparing for reading examinations. Undergraduates admitted with permission of the instructor. No academic credit for graduate students. Prerequisite: German 4 or 47, or the equivalent.

51–52 *Introduction to German Literature* (3–3)

Osterle

Academic year—evening. Prerequisite: German 4 or the equivalent.

* The Staff of Instruction here listed is for the academic year 1960–61.

SECOND GROUP

- 103-4 *Goethe's "Faust"—Parts I and II* (3-3) Legner
1962-63 and alternate years.
- 131-32 *German Literature of the Eighteenth Century* (3-3) Rogers
1961-62 and alternate years: academic year—evening. The age of Lessing, Goethe, and Schiller.
- 141-42 *German Literature of the Nineteenth Century* (3-3) King
1961-62 and alternate years: academic year—evening. Romanticism, Biedermeier period, Young Germany, Realism.
- 151-52 *German Literature of the Twentieth Century* (3-3) Rogers
1962-63 and alternate years.
- 179-80 *Advanced Composition for Undergraduate and Graduate Majors* (1-1) King, Legner
Academic year—as arranged.

THIRD GROUP

- 201-2 *Middle High German* (3-3) Legner
1961-62 and alternate years: academic year—evening.
- 205-6 *Gothic* (3-3) Legner
1962-63 and alternate years. Introduction to the comparative study of Germanic languages.
- 209-10 *Old High German* (3-3) King
1962-63 and alternate years.
- 213-14 *Old Norse* (3-3) Allee
1961-62 and alternate years: academic year—evening.
- 221-22 *General Linguistics; Comparative and Historical Indo-European Linguistics* (3-3) King
1961-62 and alternate years: academic year—afternoon. *First half*: introduction to linguistics as a science. *Second half*: introduction to comparative and historical linguistics, with special reference to the Indo-European family.
- 223-24 *Linguistic Analysis of Modern German* (3-3)
1962-63 and every third year. Treatment of phonetics, phonemics, morphology, and syntax.
- 225-26 *Seminar: Linguistics* (3-3) The Staff
1962-63 and every third year. Bibliography, methodology, readings, and research problems.
- 229 *German Literature of the Fifteenth and Sixteenth Centuries* (3) Legner
1961-62 and alternate years: fall—afternoon. Transition from chivalric to bourgeois literature. The eras of Humanism and the Reformation as reflected in the principal literary works.
- 230 *German Literature of the Seventeenth Century* (3) Legner
1961-62 and alternate years: spring—afternoon. Imitation of foreign models. The literary societies. Preciosity. The beginnings of realism in the novel. Pietism.
- 231-32 *German Classicism* (3-3) Rogers
1962-63 and alternate years. An advanced study and critique of the literature of the Goethezeit. Prerequisite: German 131-32 or the equivalent.
- 241-42 *Seminar: German Romanticism* (3-3) King
1962-63 and alternate years. Treatment of individual writers, groups, motifs, and tendencies.

- 251-52 *Seminar: Studies in Twentieth Century German Literature* Rogers
(3-3)
1961-62 and alternate years: academic year—afternoon. Special projects in fiction, drama, poetry, and criticism.
- 261-62 *German-English and German-American Literary Relations and Interactions* Osterle
(3-3)
Not offered 1961-62. Comparative study of major genres. Appraisal of influences.
- 271-72 *Seminar: German Literature* The Staff
(3-3)
1962-63 and alternate years. Bibliography, methodology, readings, and research problems.
- 299-300 *Thesis* The Staff
(3-3)
Academic year—as arranged. Required of all candidates for the Master's degree in German.

RELATED COURSES IN OTHER DEPARTMENTS

English 223-24 *Old English*English 225 *Applied Linguistics*

HISTORY*

Professors E. L. Kayser, Wood Gray, H. M. Merriman†, R. H. Davison (*Executive Officer*)

Associate Professors W. C. Davis, R. B. Thompson, R. C. Haskett‡

Assistant Professor C. J. Herber

Instructor P. P. Hill

Bachelor of Arts with a major in History (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51-52. Courses must include History 39-40 and 71-72.

Required: the general requirements of Columbian College as stated on pages 61-65 and the grade of "pass" on the History major examination at the end of the senior year.

The major, centered on the study of the rise, development, and spread, and the continuing challenges of Western civilization, is attested by a major examination. Under the guidance of an adviser the student will arrange his program in History to attain a balanced coverage of (1) the rise of civilization in Europe to the eve of the French Revolution, (2) the spread of Western culture throughout the world since the close of the fifteenth century, (3) the historic problems of modern industrial civilization from the beginnings of the Industrial Revolution, and (4) the relations of the major nations of Europe and America in their world setting since the Napoleonic Wars. A six-hour research seminar to give training in fundamental techniques is a required part of each major's program, and a proseminar (History 199-200) is offered as a means of integrating the student's understanding of the continuity of Western civilization. For details relating to the administration and content of the major, see the pamphlet on this subject, which is available in the offices of the Dean of Columbian College and the Executive Officer of the History Department.

Bachelor of Arts with a major in Latin American Civilization (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51-52.

Required: the general requirements of Columbian College as stated on pages 61-65 and the grade of "pass" on the Latin American Civilization major examination at the end of

* The Staff of Instruction here listed is for the academic year 1960-61.

† On sabbatical leave fall semester 1960-61.

‡ On sabbatical leave spring semester 1960-61.

the senior year. The coordinated field of knowledge upon which the student will be examined includes political and social history, economic development, governmental structures and international relations, and the principal literary works and writers of the Latin American republics. The Department of History provides a proseminar (History 197-98) intended to assist the student in preparing himself for the major examination. For further details, see the pamphlet, which is available in the Office of the Dean of Columbian College.

Master of Arts in the field of History (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in History from this University, or the equivalent, and the approval of the Department.

Required: the general requirements of Columbian College, as stated on pages 66-69. Of the twenty-four semester hours of required second- and third-group courses (exclusive of the thesis), at least six must be in third-group history courses; a maximum of six may be in a closely related field outside the Department of History as approved by the Department. Master's candidates are responsible for arranging with instructors of second-group courses for extra work, in order to receive graduate credit for such courses.

Master of Arts in the field of Latin American Civilization (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in Latin American Civilization from this University, or the equivalent.

Required: the general requirements of Columbian College, as stated on pages 66-69. Course work and the comprehensive examinations will embrace political and social history, governmental structures and international relations, economic development, and principal literary works of Latin America. The thesis may be written in any one of these four fields. All courses must be approved in advance by the Adviser.

Doctor of Philosophy (Graduate Council).—See page 73.

Bachelor of Arts in Education with a teaching field in History (School of Education).—

Prerequisite: the Education curriculum, pages 53-54.

Required: the History option and the professional courses listed in the School of Education Catalogue.

FIRST GROUP

39-40 *The Development of European Civilization (3-3)* Kayser, Herber
Academic year—morning and evening; summer 1961. Primarily for freshmen.
First half: the political, social, economic, and cultural history of the Old World from ancient times to 1715. Second half: from 1715 to the present.

71-72 *The Development of the Civilization of the United States (3-3)* Haskett, Hill

Academic year—morning and evening; summer 1961. Primarily for sophomores.
First half: the political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. Second half: from 1865 to the present.

SECOND GROUP*

109 *Intellectual History of the Western World I: the Classical World (3)* Kayser
Not offered 1961-62.

110 *Intellectual History of the Western World II: the Middle Ages and Renaissance (3)* Kayser
Not offered 1961-62.

119 *Intellectual History of the Western World III: from the Reformation through the Age of Reason (3)* Kayser
Not offered 1961-62.

120 *Intellectual History of the Western World IV: Intellectual Aspects of the Modern Age (3)* Kayser
Not offered 1961-62.

* History 39-40 is prerequisite to courses 109 through 152 and 190 through 196; History 71-72, to courses 171 through 184; either History 39-40 or 71-72, to courses 161 through 166.

- 130 *Nationalism* (3) Kayser
Summer 1961. The historical evolution of modern nationalism.
- 131-32 *History of Germany* (3-3) Herber
Not offered 1961-62. The political, social, and cultural development of the German people. *First half*: from the Reformation to 1871. *Second half*: from 1871 to the present.
- 141-42 *History of France* (3-3) Herber
Academic year—morning. A survey of the political, social, and cultural history of France. *First half*: from earliest times to 1815. *Second half*: from 1815 to the present.
- 143 *History of Old Russia* (3) Thompson
Fall—afternoon. The Slavic and Eurasian roots of Russian society and politics over a thousand-year period, 800-1800.
- 145-46 *History of Modern Russia* (3-3) Thompson
Academic year—evening. The rise and fall of the revolutionary cycle. *First half*: Tsarist Russia in the Golden Age, 1800-1917. *Second half*: Soviet Russia and the politics of empire, since 1917.
- 147 *Economic History of Europe* (3) Gray
Not offered 1961-62. A survey from ancient times to the present day.
- 148 *Oversea Expansion of Europe* (3)
Not offered 1961-62. International rivalries and the impact of European civilization in Africa and the Pacific basin since 1500, with emphasis on the 19th and 20th centuries.
- 149-50 *European Diplomatic History* (3-3) Davison
First half: 1961-62 and alternate years; fall—morning and evening. *Second half*: spring—morning. Background of the European state system and of diplomatic practices and relations since the Congress of Vienna, with emphasis on the policies and actions of the great powers and their statesmen. *First half*: to 1878. *Second half*: since 1878.
- 151-52 *English History* (3-3)
Not offered 1961-62. A general survey of the development of political, social, and economic institutions of lasting significance in the English speaking world. *First half*: to 1689. *Second half*: since 1689.
- 161 *Ancient Americans* (3) Davis
1962-63 and alternate years; summer 1961. A study of the Maya, Aztec, Inca, and other early civilizations of North and South America.
- 162 *Iberian Background of Latin America* (3) Davis
1962-63 and alternate years. History of Spain and Portugal, with emphasis on developments leading to the rise and decline of the Spanish and Portuguese empires.
- 163 *Colonial Latin America* (3) Davis
Fall—morning. Political, economic, social, and institutional developments in Spanish and Portuguese America from the conquest through the wars of independence.
- 164 *South America since Independence* (3) Davis
Alternate spring and summer terms: summer 1962; spring 1963. Development of the independent South American states in the 19th and 20th centuries.
- 166 *Mexico and the Caribbean since Independence* (3) Davis
Alternate spring and summer terms: summer 1961; spring 1962—morning. A survey of the republics of Mexico, Central America, and the Caribbean islands.
- 170 *American Colonial History* (3) Haskett
Spring—evening. The settlement of the British colonies, the development of provincial institutions, and the emergence of an American civilization in the 17th and 18th centuries.

- 171-72 *Social History of the United States* (3-3) Gray
Academic year—morning; summer 1961—History 171 (3). Daily life, institutions, intellectual and artistic achievements of the Agrarian Era, 1607-1861; and the Urban-Industrial Era, 1861 to the present time.
- 173 *Representative Americans* (3) Gray
Spring—morning; summer 1961. A biographical approach to national history. Some fifty significant and pivotal personalities in the development of the United States in government, business, science, religion, journalism, the arts, and social reform.
- 174 *Economic History of the United States* (3) Gray
Fall—evening. Main trends in the development of American agriculture, industry, and trade since 1607, with their Old World backgrounds and in their world setting.
- 175-76 *Political and Constitutional History of the United States* (3-3) Haskett
Academic year—morning. First half: to the eve of the Civil War. Second half: the Civil War to 1940.
- 177 *The South* (3) Gray
Fall—morning. Rise of the plantation system and slavery; the intersectional conflict; and the problems and progress of the New South.
- 178 *The West* (3)
Not offered 1961-62. The role of the frontier in American history.
- 181-82 *Diplomatic History of the United States* (3-3) Merriman, Hill
Academic year—morning and evening; summer 1961—History 182 (3). Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; and the activities of the American secretaries of state and diplomatic agents. First half: to 1898. Second half: since 1898.
- 183 *Oversea Expansion of the United States* (3) Merriman
Spring—morning. The political, economic, social, and cultural life of our outlying possessions.
- 184 *Canada and the United States* (3) Merriman
Fall—morning. The historical background and main trends in the relationship of the two English-speaking peoples of North America.
- 190 *History of India* (3) Thompson
Summer 1961. The civilization of India and her neighbors from the beginnings to independence.
- 191-92 *Current History* (1-1) Kayser
Academic year—afternoon. Contemporary events in their world setting.
- 193 *History of the Near East* (3) Davison
1962-63 and alternate years. The Byzantine, Arab, Persian, and Islamic backgrounds of Near Eastern history; the rise and decline of the Ottoman Empire; the action of European powers in the area; and the Ottoman breakup into the Turkish Republic and other successor states.
- 195-96 *History of the Far East* (3-3) Thompson
First half: spring 1962—afternoon; the civilization of China and Japan from the beginnings to 1600. Second half: not offered 1961-62; the modern Far East under the impact of the West since 1600.
- 197-98 *Proseminar in Latin American Civilization* (3-3) Davis, Robb, Sammons
Academic year—as arranged. Reading course for coordination and review. Open only to majors in Latin American Civilization.
- 199-200 *Proseminar: Readings for the History Major* (3-3) Thompson
Academic year—evening. Limited to majors in History. Readings and discussions on main trends in the history of Western civilization, including representative selections from the classics of historical literature.

THIRD GROUP*

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| 241-42 <i>Seminar in Modern European History</i> (3-3) Academic year—evening. | Herber |
| 243 <i>Reading Course in Modern European History</i> (3) Spring—as arranged. Primarily for graduate students. | Davison |
| 246 <i>Seminar in Eurasian History</i> (3) Spring—evening. | Thompson |
| 247 <i>Reading Course in Russian History</i> (3) Fall—evening. Primarily for graduate students. | Thompson |
| 249 <i>Seminar in European Diplomatic History</i> (3) Spring—afternoon. | Davison |
| 261-62 <i>Seminar in Latin American History</i> (3-3) 1961-62 and alternate years: academic year—afternoon. | Davis |
| 271-72 <i>Seminar in the Social History of the United States</i> (3-3) Academic year—evening. | Gray |
| 274 <i>Reading Course in American Economic and Social History</i> (3) Spring—as arranged. Primarily for graduate students. | Gray |
| 275-76 <i>Seminar in American Political and Constitutional History</i> (3-3) Academic year—evening. | Haskett |
| 277-78 <i>Reading Course in American Political and Constitutional History</i> (3-3) First half: 1962-63 and alternate years—fall as arranged. Second half: 1961-62 and alternate years—fall as arranged. Primarily for graduate students. | Haskett |
| 281-82 <i>Seminar in the Diplomatic History of the United States</i> (3-3) Academic year—afternoon. | Merriman |
| 285-86 <i>Reading Course in American Diplomatic History</i> (3-3) Academic year—evening. Primarily for graduate students. | Merriman |
| 291-92 <i>Seminar</i> (3-3) Academic year—as arranged; summer 1961. Prerequisite: approval of the Department. | The Staff |
| 294 <i>Seminar in the History of the Modern Near East</i> (3) Fall—afternoon. | Davison |
| 299-300 <i>Thesis</i> (3-3) Academic year—as arranged; summer 1961. Required of all candidates for the Master's degree specializing in history. | The Staff |

* Approval of the instructor is required for registration in each third-group course.

HOME ECONOMICS*

Executive Officer (effective September 1961): Kathryn Towne
Professors Frances Kirkpatrick (*Executive Officer*), Kathryn Towne

Bachelor of Science with a major in Home Economics (School of Education).—Prerequisite: the Home Economics curriculum in the Junior College, see page 54. The requirements for the degree are stated on pages 123-24 and 125.

Bachelor of Arts in Education with a teaching field in Home Economics (School of Education).—Prerequisite: the Education curriculum on pages 53 and 54.

Required: the Home Economics option and the professional courses listed in the School of Education Catalogue. (See also special bulletin.)

FIRST GROUP

1 *Food Selection and Preparation* (3)

Fall—morning; spring—evening. Composition, selection, and preparation of food; analysis of recipes; standard products; planning, preparing, serving, and estimating the cost of meals. Material fee, \$18.

22 *Clothing: Its Selection, Cost, and Care* (3)

Towne

Fall—morning. Clothing selections—the economic, aesthetic, and hygienic aspects; the application of the principles of color and design to individual selection; the care of clothing.

51 *Family Meals* (3)

Spring—morning. The choice, purchase, preparation, and service of foods; dietary standards, food habits, and the nutritional needs of the family; problems of purchasing, care, and use of food by the consumer. Material fee, \$11.

53 *Family Health and Household Sanitation* (3)

Fall—morning. Home hygiene and home care of the sick; the principles of household sanitation in relation to health and diseases.

62 *Clothing Construction* (3)

Towne

Spring—afternoon. Simplified techniques and unit method of construction suitable for cotton, wool, silk, and man-made fibers; the use of commercial patterns and their alteration; the proper selection of color, design, and fabric. Material fee, \$8.

66 *Fabric Decoration* (3)

Towne

Lecture (1 hour), laboratory (4 hours). Not offered 1961-62. Original pattern and color combinations; application to a variety of hand methods of decorating fabrics for use as clothing, draperies, and upholstery; use of stencils, block and screen printing, and other simple equipment.

71 *Costume Design and Fashion Economics* (3)

Towne

Spring—afternoon. Factors determining fashions and effect on cost of clothing, problems of the consumer of textiles and clothing, historic costume and its relation to modern dress. Material fee, \$8.

72 *Household Textiles* (3)

Towne

Fall—morning. Properties, uses, and tests of the different textile fibers and fabrics, and development of judgment and knowledge of standard for the consumer of clothing and house-furnishing material. Material fee, \$8.

77 *Marketing* (3)

Not offered 1961-62. Purchasing of foods as it relates to the home and to the institution.

SECOND GROUP

102 *Advanced Food Preparation* (3)

Not offered 1961-62. The application of the fundamental processes of food preparation to a wider range of food materials and various services for different occasions. Material fee, \$18.

* The Staff of Instruction here listed is for the academic year 1960-61.

- 106 *Quantity Cookery* (3)
Not offered 1961-62.
- 123 *Household Finance and Problems of the Consumer* (3) Towne
Fall—morning. Economic problems of the family in modern industrial society, family income, income apportionment and household expenditures, laws affecting the home, investments, consumer buying.
- 143 *Advanced Clothing Construction* (3) Towne
Not offered 1961-62. Problems of clothing construction and flat pattern designing. Material fee, \$8.
- 148 *Food Problems and Demonstration Methods* (3)
Fall—afternoon. Factors affecting the preparation of standard products from the experimental viewpoint, principles of demonstration. Material fee, \$18.
- 152 *Nutrition* (3)
Spring—morning. Lecture course on the principles of normal and abnormal human nutrition. Laboratory work on the calculation and preparation of dietaries. Laboratory fee, \$8.
- 154 *Diet Therapy* (3)
Not offered 1961-62. Study of nutrition as applied to diet and disease. Material fee, \$8.
- 164 *Child Nutrition* (3)
Not offered 1961-62. Basic principles and practices in nutrition at infant, pre-school, and adolescent ages. Demonstration of nutritional and special food requirements.
- 168 *Institutional Management* (3)
Not offered 1961-62. Study of the organization, equipment, and marketing problems of institutions.
- 171 *House Furnishing* (3) Towne
Fall—evening. Home planning from the historic, artistic, economic, and sanitary viewpoints; home furnishings such as linens, dishes, floor covering, mattresses, etc. Material fee, \$5.
- 172 *Problems in Home Furnishings* (3) Towne
Spring: lecture (1 hour), laboratory (4 hours)—evening. Workshop-type course in home furnishings, including upholstering, slip covering, refinishing furniture, and making draperies.
- 181 *The Child in the Home* (3)
Spring—afternoon. Care and development of children, parent-child relationships.
- 192 *The Home, Its Management and Equipment* (3)
Not offered 1961-62. Economic management of the home; distribution of time and energy; problems in the selection, arrangement, and care of equipment.
- 193 *Supervision of Home Management* (3) The Staff
Fall—as arranged. Field work under supervision. Designed to meet requirements of those preparing to teach in federally aided schools.
- 195-96 *Special Problems* (3-3) The Staff
Academic year—as arranged. Individual investigation or study under the guidance of a member of the Staff; such problems as marketing, draping, and tailoring.
- 197-98 *Proseminar* (3-3) The Staff
Academic year—evening. The study of the most recent materials and problems in the various phases of home economics.

JOURNALISM*

Professor R. P. Schlabach, Jr. (*Executive Officer*)

Associate Professor R. C. Willson

Lecturers F. L. Dennis, J. V. Hinkel, Louis Robinson, T. R. Smith

Bachelor of Arts with a major in Journalism (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51-52, including English 51-52 or 71-72, History 71-72, Political Science 9-10, and Journalism 71-72.

Required:

- (1) The general requirements of Columbian College, as stated on pages 61-65.
- (2) Twenty-four hours of second group courses in Journalism, as follows: (a) Journalism 111, 196, 198; (b) nine hours chosen from Journalism 121, 133, 137, 144, 151; (c) six hours chosen from Journalism 115, 140, 142, 143, 145.
- (3) Twelve hours of second group courses, chosen in consultation with the major adviser, in one other department of Columbian College. Students selecting science may take courses in more than one department.

FIRST GROUP

- 71-72 *Journalism in American Society* (3-3) Willson
Academic year—morning and evening; summer 1961—Journalism 72 (3). Evolution of newspapers and other media in relation to political, social, and economic life; the concept of press freedom; problems of contemporary journalism.

SECOND GROUP

- 111 *Reporting* (3) Schlabach
Fall—morning; spring—evening; summer 1961. Instruction and classroom practice in gathering, evaluating, and writing news; emphasis on newspapers, other media considered.
- 115 *Editing and Make-up* (3) Schlabach
Fall—morning; summer 1961. Editing of news and other material for publication, typography and display; use of pictures and other graphic presentations.
- 121 *Advanced Reporting: Magazine Feature Articles* (3) Willson
Fall—evening; summer 1961. Instruction and practice in writing magazine articles, material for which is obtained through independent investigation.
- 133 *Advanced Reporting: Community News* (3) Schlabach
Fall—morning. Instruction and practice in coverage and writing of local news.
- 137 *Advanced Reporting: National Affairs* (3) _____
Spring—afternoon. Instruction and practice in coverage and writing of federal government news from the point of view of the press association.
- 140 *Pictorial Journalism* (3) Smith
Spring—evening. Photographic techniques affecting publication, the illustration and the story angle, standards of judgment in selection and use of pictures, captions, editing technique, cropping for effective reproduction.
- 142 *Retail Newspaper Advertising* (3) Robinson
Spring—evening. Retail newspaper advertising management, coordination of newspaper advertising with retail sales patterns, advertising readership, copy preparation, production methods.
- 143 *Industrial Communications* (3) Willson
Not offered 1961-62. An introduction to the field of corporate journalism. Writing and editing the employee magazine. Preparation of annual reports. Editing stockholder publications, and external house organs.

* The Staff of Instruction here listed is for the academic year 1960-61.

- 144 *Advanced Reporting: the Arts and Sciences* (3) Willson
Spring—morning. Instruction and practice in writing articles for publication in such fields as the arts, business and economics, science, and technology.
- 145 *Principles and Problems of Public Relations* (3) Hinkel
Fall—Saturday morning. Principles, problems, and ethics of public relations for government agencies, commercial establishments, educational and other public institutions. Case histories of successful programs.
- 151 *Editorial Writing* (3) Schlabach
Not offered 1961-62. Instruction and practice in writing of editorials on public affairs.
- 196 *Seminar* (3) Schlabach
Spring—Saturday morning. For Journalism majors only. Research in areas relating journalism to secondary fields of study.
- 198 *Law of the Press* (3) Dennis
Fall—Saturday morning. Freedom of the press, censorship, legislative controls, publications as contempt of court, copyright, news gathering agencies, labor law and the newspaper business, law of libel, privileged matter, fair comment on public characters, right of privacy.

LAW*

Professors W. T. Fryer†, C. D. Benson, J. F. Davison, O. S. Colclough, L. S. Merri-
field, H. I. Orentlicher†, O. H. Walburn, D. B. Weaver, L. H. Mayo, G. E. Wes-
ton, R. M. Cooper, W. T. Mallison, Jr.‡, C. B. Nutting, R. G. Dixon, Jr., Robert
Kramer
Adjunct Professors J. W. Jackson, F. H. Myers
Professorial Lecturers J. A. McIntire, J. L. Edgerton, P. F. Herrick, G. E. Monk,
C. J. Zinn, L. J. Harris, J. J. Czyzak, L. P. Walsh, E. A. Beard, Murdock Head,
G. N. Robillard
Associate Professors J. R. Hambrick, G. A. Ledakis
Associate Professorial Lecturers P. A. Rose, H. J. Liebesny, T. H. Brown, P. J.
Federico, G. J. Goldsborough
Assistant Professors M. H. Freedman, W. J. Baker, J. J. McAvoy, R. J. Temple,
D. E. Seidelson, D. J. Sharpe, J. P. Sullivan
Lecturers W. W. Goodrich, Vincent Kleinfeld, N. E. Allen, M. F. Cohen, R. C.
Nash, Jr., H. P. Green, G. W. Shelhorse, E. A. Potts, J. A. Barron, R. B. Bilder,
John Bodner, Jr., M. G. Coerper, S. J. L'Hommedieu, Jr.
Clerk of the Trial Practice Court J. A. Kendrick
Associate Clerk of the Trial Practice Court D. G. Skinker
Special Lecturers Kitty Frank, Alfred Hantman, A. L. Stevas

For the requirements for the degrees of *Bachelor of Laws*, *Master of Laws*, *Master of Comparative Law*, *Master of Comparative Law (American Practice)*, and *Doctor of Jurid-
ical Science*, see pages 92-94, 95-96.

* The Staff of Instruction here listed is for the academic year 1960-61.

† On leave of absence 1960-61.

‡ On sabbatical leave 1960-61.

FIRST YEAR

- 110 *Constitutional Law* (4) Mayo, Dixon
 Spring—morning and evening. Basic principles of American constitutionalism; judicial function in constitutional cases; implementation of doctrines of separation of powers, federalism, limited government; development and exercise of national powers; introduction to civil rights and liberties.
- 115-16 *Contracts I-II* (4-2) Mayo, Freedman, Temple, Shelhorse
 Academic year—morning and evening; summer 1961. Legal remedies of contracting parties, including damages in contract and quasi-contract, specific performance, reformation, rescission, and remedies in tort; acts creating and terminating contractual rights, including offer and acceptance, mistake, and problems of proof; the function of consideration; conditions; assignments; third-party beneficiaries; the effect of changed circumstances; and protection of the client's interests upon breach or threat of breach by the other party. Emphasis on problems of analysis, draftsmanship, and adversary method.
- 125 *Criminal Law and Procedure* (4) Cooper, L'Hommedieu
 Spring—morning and evening. Origin and purposes of criminal law; elements of criminal liability; mental disorders; solicitation, attempt, and conspiracy; crimes against the person, against property, and against both; statutory offenses; criminal procedure, with consideration of Federal Rules of Criminal Procedure.
- 135 *Legal Method and Legal System* (4) Fryer, Benson, Orentlicher, Sharpe, Goldsborough, Barron
 Fall—morning and evening; spring—morning and evening. Introduction to substantive and procedural law dealing with basic concepts; training in method and technique of case law and legislation using modern case records; practice in use of law books and in legal writing; importance of language in law; legal reasoning and use of precedents under doctrines of stare decisis, law of the case, and res judicata; development of Anglo-American legal system; organization of judiciary and bar, stressing enforcement of ethical standards.
- 145 *Personal Property* (2) Fryer, McAvoy, Sullivan, Nash, Bilder
 Fall—morning and evening; spring—morning and evening. Concepts of property, including interests created by bailments, liens, and pledges; methods of acquiring ownership.
- 150 *Real Property* (4) Benson, Walburn, Ledakis, Sullivan, Baker
 Fall—morning and evening; spring—morning; summer 1961. Historical background of the law of estates and conveyancing; types of estates; dower and curtesy; landlord and tenant relationship; concurrent estates; future interests at common law and after the Statute of Uses; the Rule Against Perpetuities; incidents of divided ownership, as waste; natural rights.
- 160 *Torts* (4) Merrifield, Walburn, Temple
 Fall—morning; spring—morning and evening. Liability for harm to persons or tangible things; defamation and invasion of privacy.

SECOND YEAR

- 201 *Agency* (2) Cooper, Sharpe
 Fall—morning and evening; summer 1961. Master and servant (status of agent), respondeat superior, nature of agency relation, actual authority, parties (disclosed and undisclosed principal), unauthorized transactions, notice, notification.
- 202 *Administrative Law* (4) Davison
 Fall—evening; spring—morning; summer 1961. The position of the administrative process in the separation of powers, including the status of administrative personnel, administrative hearings, judicial scrutiny of administrative action, discretion, and rule-making—particularly as relating to federal administrative agencies.

205 Brief Writing and Oral Argument (2)

Not offered 1961-62. Exposition and study of the basic techniques of written and oral legal argumentation. Each student will be required to write, as a term paper, a brief presenting contentions based on the actual record in an unargued case.

210 Business Associations (4)

McAvoy, Seidelson

Fall—morning and evening; summer 1961. Contrast of the partnership and corporation as alternative forms of organization; organizing partnerships and corporations—formalities, capital contributions, share structure; problems of operation; relations between partners; roles of shareholders, directors, officers; control devices; distributions to owners; voluntary reorganization; dissolution and termination.

215 Civil Procedure (4)

Walburn, Temple

Fall—morning and evening; summer 1961. The mechanics of litigation—the rules which govern the process by which the rights and duties studied in substantive law courses are enforced: pleadings, discovery, pre- and post-trial motions, jurisdiction and venue, applicable law—state or federal, former adjudication. Emphasis is on the Federal Rules of Civil Procedure but the principles and main problems indigenous to procedural systems are developed, thus providing a basis for further study of the various state systems.

219 Commercial Paper (4)

Orentlicher, Ledakis

Fall—morning and evening; summer 1961. Bills of exchange; promissory notes and checks, especially under the Negotiable Instruments Law; bonds and other forms of investment paper; problems under the Uniform Stock Transfer Act.

224 Commercial Transactions (4)

Ledakis

Spring—morning and evening. The law relating to the sale and distribution of goods, and to the security financing devices utilized in this connection, with particular attention to the effect of uniform laws.

230 Conveyances (2)

Walburn, Baker

Fall—morning and evening; spring—evening; summer 1961. Conveyances, recording; easements, profits, covenants, and equitable servitudes; adverse possession and adverse user; zoning and other land controls.

235 Domestic Relations (2)

Potts, Seidelson

Fall—morning and evening; spring—evening; summer 1961. Marriage, annulment, and divorce; adoption and custody of children; economic relations.

238 Equity (2)

Freedman

Spring—morning and evening; summer 1961. A correlation of aspects of equity considered in earlier courses, and inquiring into the nature of equity jurisprudence through analysis of selected problems in equity: historical development of equity, including problems of merger of law and equity; use of equity jurisdiction offensively and defensively, including multi-party actions, injunction of executive and legal actions, and equitable abstention; emphasis on the fashioning of equitable remedies.

240 Evidence (4)

Fryer, Weston

Spring—morning and evening; summer 1961. Functions of court and jury; qualifications and examination of witnesses; opinion, relevancy, and scientific evidence; proof of writing; application of the hearsay rule.

243 Federal Jurisdiction (2)

Cooper

Fall—morning and evening. Constitutional and statutory origins of federal courts, cases arising under the laws and the Constitution, diversity of citizenship, jurisdictional amount, removal procedure and jurisdiction, limitations on federal jurisdiction, state and federal conflicts, substantive law applied by federal courts.

251 Insurance (2)

Temple

Spring—evening; summer 1961. The insurance device in life, property, and other risks.

- 254 *International Law and World Order* (4) Mallison, Czyzak, Coerper
Fall—morning and evening. Traditional content of course in international law presented in context of values and institutions of the world community; formal prescription and effective practice concerning participants in decision-making processes; roles of individuals, international public organizations, political parties, pressure groups, private associations, and national states.
- 259 *Labor Law* (4) Merrifield
Spring—morning and evening; summer 1961. Law governing labor-management relations, organization and representation of employees, regulation of economic weapons, enforcement of collective bargaining agreements, interunion and intraunion relations.
- 265 *Law and Accounting* (2) Hambrick, Weaver
Fall—morning; spring—evening. Study of fundamental accounting principles with emphasis on corporation accounting; legal and accounting implications of specific items on financial statements of corporations; inventory adjustments; corporate transactions, distributions, and capital adjustments.
- 270 *Legislation* (2) Nutting, Mallison
Fall—evening; spring—morning. The legislative process and roles of various participants in the process; operation of the United States Congress and state legislatures, including fact finding, organization, and procedure; problems of statutory interpretation.
- 274 *Taxation—Federal Estate and Gift* (2) Hambrick
Fall—morning and evening. A survey of the substantive provisions of the federal estate and gift tax laws, including inter vivos transfers, transfers in contemplation of death, joint interests, life insurance proceeds, property subject to powers of appointment, the marital deduction and split gifts; tax procedure.
- 279 *Taxation—Federal Income* (4) Hambrick, Weaver
Fall—evening; spring—morning; summer 1961. Survey of substantive provisions of federal income tax, including concept of gross income, limitations on allowable deductions, problems of capital gains taxation, nontaxable exchanges of property, basis problems, provisions affecting the taxation of the family, and principles of income tax accounting.
- 285-86 *Trusts and Estates I-II* (2-4) Weaver, McAvoy
Academic year—morning and evening. An integrated view of considerations (other than tax) in noncommercial transfers of wealth at death or during life with emphasis on the drafting of documents best suited to achieve the wishes of the property owner and meet the needs of his family. *First half*: distribution and administration of intestate estates; formal requirements for execution of wills and trusts; revocation and alteration; grounds for contest; limits on testamentary freedom. *Second Half*: dispositive provisions in wills and trusts; common problems of construction; future interests questions including class gifts, powers of appointment, and limits imposed by Rule Against Perpetuities, etc.; problems of administration of estates and trusts including allocations to principal or income, investments, powers to manage, sell, etc.; charitable trusts. Supervised practice in drafting is included. Prerequisite to Law 286; Law 285.
- 295 *Unfair Trade Practices* (4) Weston, Bodner
Fall—morning and evening; summer 1961. Unfair trade practices at common law and under statutes; trade-marks, trade names; copyright law; misappropriation of ideas; protection of competitors and consumers against false advertising under Federal Trade Commission Act; resale price maintenance under state Fair Trade Acts; state sales-below-cost statutes; Robinson-Patman Price Discrimination Act; miscellaneous business practices.
- 302 *Admiralty* (2) Sharpe
Spring—evening. Federal and state jurisdiction; jurisdiction over waters, craft, contracts, torts, crimes, in equitable matters, etc.; laws applicable to maritime workers and maritime liens.

- 307-8 Comparative Law I-II (2-2)** Davison
First half: fall—morning and evening. *Second half:* spring—evening. The Civil Law System; general introduction to foreign law as exemplified by Roman Law and the French and German Civil Codes; comparative study of administration of justice and legal institutions. *Comparative Law I*, dealing with delictual obligations, may be taken independently of *Comparative Law II*, which deals with contractual obligations.
- 309 Conflict of Laws (4)** Dixon
 Fall—morning and evening; summer 1961. Legal problems arising from occurrences transcending state or national boundaries; jurisdiction; foreign judgments; constitutional influences; theoretical bases of choice of law principles and their application to specific fields, including torts, contracts, property, family law, administration of estates, and business associations.
- 313 Constitutional Interpretations (2)** Dixon
 Spring—evening. Advanced course in constitutional law. The Constitution and constitutional tradition, process of judicial decision-making, significance of "due process", current constitutional developments, adequacy of the traditional system of powers and limitations, introduction to comparative constitutional law.
- 318 Creditors' Rights (4)** Ledakis
 Spring—morning and evening; summer 1961. Remedies of unsecured creditors; judgments, fraudulent conveyances, creditors' agreements, equity and statutory receiverships, and bankruptcy. The general approach is that of law administration.
- 321-22 Current Decisions (2-2)** Weston, Seidelson, Sullivan
 Academic year—morning and evening. Required of, and limited to, members of the student staff of the *Law Review*.
- 330 Federal Antitrust Laws (4)** Weston
 Spring—evening. Restraints of trade at common law and under Sherman Antitrust Act of 1890, Federal Trade Commission and Clayton Acts by mergers, monopolies, price-fixing agreements, trade associations, exclusive-dealing agreements, tie-in sales, and trade boycotts; patents and copyrights under antitrust laws.
- 335 Jurisprudence (2)** Mayo, Kramer
 Fall—evening; spring—morning. History of jurisprudence; schools of jurists, particularly the nineteenth century schools; sociological jurisprudence; theories of justice; the nature of law; law and morals; law and the state; the scope and subject matter of law; sources and forms of law; the traditional element; analysis of general legal concepts.
- 339 Collective Bargaining and Labor Arbitration (2)** Merrifield
 Not offered 1961-62. The collective labor agreement: its content, negotiation, and administration through the grievance procedure and arbitration; problems in the settlement of labor disputes.
- 341 Labor Standards and Social Security Legislation (2)** Merrifield
 Fall—evening. Legal problems arising under federal and state statutes dealing with labor standards and social security. Particular emphasis is placed upon the regulation of wages and hours, workmen's compensation, and insurance against unemployment and old age.
- 345 Legislative Drafting (2)** Zinn
 Fall—evening. Advanced instruction and practice in legislative drafting.
- 349 Local Government Law (2)** Mallison
 Spring—evening. The decision-making processes in metropolitan and local communities; types and objectives of city, county, and special function local government units; intergovernmental relations; original organization and changes; local lawmaking; community planning and development.
- 355 Mortgages (2)** Orentlicher, Baker
 Spring—morning and evening; summer 1961. Security interests in real property, their creation, transfer, enforcement, and extinguishment.

- 359 *Patent Law* * (2) Robillard
Fall—evening. Origin and nature of patents, patentable subject matter, classes of patents, novelty, utility, invention, patent claims and their interpretation, acts constituting infringement, correction of patents.
- 360 *Advanced Topics in Patent Law* (2) Harris
Spring—evening. Lectures and discussion; licensing and protection of industrial property; uses and abuses of patents; governmental regulation; protection abroad; the role of patents in business; economic and social functions of patents, trade-marks, and copyrights. Prerequisite: Law 359.
- 362 *Patent Office Practice* * (2) Rose
Spring—evening. Rules and practice; appeal and interference procedure.
- 365-66 *Patent Trial Practice Court* * (2-2) Brown, Federico
Academic year—evening. Practice before the United States Court of Customs and Patent Appeals and the federal courts. Prerequisite: forty-two semester hours, including Law 215 and 240. Law 359, which is also required, may be taken concurrently. *Patent Trial Practice Court* may be elected instead of Law 385-86 to satisfy the Trial Practice Court requirement. If *Patent Trial Practice Court* is started in the spring semester, Law 240 may be taken concurrently.
- 370 *Public Utilities* (2) Fryer
Spring—evening. Regulation by federal, state, and municipal authorities concerned with licensing, rates, services, and practices, with emphasis on federal regulation of interstate operations; judicial review.
- 376 *Restitution* (2) Orentlicher, Sharpe
Spring—morning and evening; summer 1961. Remedies at law and in equity for restitution of benefits conferred, especially as based on the concept of unjust enrichment.
- 380 *Suretyship* (2) Orentlicher
Summer 1961. The law of suretyship, especially in the context of accommodation credit and commercial and financial practices, with attention also to informal and non-consensual suretyship relations and the place of suretyship principles in the solution of legal problems generally.
- 385-86 *Trial Practice Court* (2-2) Jackson, Myers, Edgerton, Herrick, Monk, Walsh, Beard, Kendrick, Skinker
Academic year—morning and evening. Trial of assigned cases; trial tactics and techniques; pre-trial and court room procedures pursuant to Federal Rules. To be taken in the senior year. Prerequisite: forty-two semester hours, including Law 215 and 240. If *Trial Practice Court* is started in the spring semester, Law 240 may be taken concurrently.
- 391 *United Nations Constitutional Law* (2) Mallison
Spring—evening. Structure and process of decision of the United Nations—the peaceful settlement of disputes, collective security, regulation of armaments, regional arrangements, and types of functional cooperation.

GRADUATE COURSES

- 401 *Administrative Law Seminar* (2) Davison
Spring—evening. Group study of specific problems in administrative law.
- 408 *Constitutional Law Seminar* (2) Nutting, Dixon
Spring—morning. Group study of contemporary problems in constitutional law.
- 412 *Control and Use of Atomic Energy* (2) Green
Spring—evening. Various legal problems involved in the control and use of atomic energy will be examined, including the Atomic Energy Act, the policy underlying the
- * Patent law students may take Law 359 and Law 365 concurrently in the fall semester and Law 362 and Law 366 concurrently in the spring semester.

present government monopoly, the security problem of safeguarding atomic military information, the implications in prospective industrial control and use, and legal means of protecting personal interests against the possible consequences of atomic warfare.

416 Criminal Practice and Administration (2)

Cooper

Spring—Sat. morning. Group study of the fundamental aspects of criminal procedure with special reference to practice before the District of Columbia and federal courts; the law of arrest, searches and seizures, self-incrimination, the function of the preliminary examination and grand jury, sufficiency of indictments, trial procedure, and the order of pleas and motions. Advance registration; limited to fifteen students.

420 Estate Planning Seminar (2)

Weaver

Spring—evening. Group study of the effective disposition of wealth, inter vivos and testamentary gifts, conservation for owner's future use, use of insurance, tax and administrative problems, business interests, pension and profit-sharing arrangements.

424 Evidence and Trials Seminar (2)

Fryer

Fall—evening. Study of selected problems involving presentation of documentary proof and expert testimony in connection with the reforms sought by the Uniform Rules of Evidence and recent developments in the field of forensic medicine.

426 Forensic Medicine (2)

Head, Sharpe

Fall—evening. Introduction to problems created by the relationships between medicine and the law: a survey of the medical professions; medical education, specialties, ethics, and professional organizations; an outline of hospital organization and facilities; selected studies in the analysis and presentation of medical aspects of legal controversies, as in personal injury litigation, workmen's compensation claims, and disputes over mental capacity, both civil and criminal; the lawyer's role in domestic and international governmental activities in medicine and public health.

428 Food and Drug Law (2)

Goodrich, Kleinfeld

Spring—evening. A lecture and discussion course dealing with the Federal Food, Drug, and Cosmetic Act and governmental controls thereunder. Both government and industry viewpoints are considered.

431 Government Contracts I (2)

McIntire

Fall—evening. A consideration of the basic power of the Federal Government to enter into contracts; the nature and construction of such contracts; normal and war or defense powers aspects of government procurement, including administrative and legislative policy and procedures; forms of contracts; standard clauses; advertised bid procedure problems; negotiated contracts; modification of contracts; remedies on contractual claims.

432 Government Contracts II (2)

McIntire

Spring—evening. Special problems in government contracts, including adjustments and relief; procedure for prosecuting claims under government contracts; attempts at price, cost, or profit control; termination. Prerequisite: Law 431.

442 Labor Law Seminar (2)

Merrifield

Fall—evening. Group study of contemporary problems in labor law.

449 Law of the Near East (2)

Liebesny

Fall—evening. A study of the law of the Arab countries, including the basic principles of the Islamic law, an analysis of the present day codes, and an investigation of the Western influences on the laws of the Arab countries.

455 Legal Problems in Modern Methods of Warfare (2)

Mallison

Fall—evening. The contemporary international law of war: legal aspects of modern methods of coercion (economic, political, psychological, and military); regulation of hostilities; the special problems of atomic, bacteriological, and chemical weapons; war crimes.

463 Regulation of Communication Media (2)

Mayo

Fall—evening. An examination of the legal doctrine relating to regulatory practices in the channels of mass communications, i.e., newspapers, motion pictures, and

radio-television; analysis of the operational structure of the mass media and the pattern of control exercised by government, private associations, and various community groups; appraisal of the comparative utility of various regulatory techniques for implementing policies affecting these media; special emphasis will be placed on the functions of the Federal Communications Commission.

466 *Regulation of Securities and Securities Markets* (2) Cohen

Not offered 1961-62. A study of state and federal laws governing the offering and distribution of securities to the public by corporate issuers and others, the regulation of securities markets, and the rights and liabilities of purchasers under such statutes. Particular emphasis will be given to statutes administered by the Securities and Exchange Commission.

469 *Research in Patent, Trade-Mark, and Copyright Law* (2) Harris

Fall—as arranged; spring—as arranged. Registration limited to students with at least a B average who have taken Patent Law I and II and related courses including, as a rule, Trade Regulation Seminar. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day. Registration permitted for one semester only; work must be completed within the semester and paper submitted not later than last day of classes.

471 *Research in Public Law* (2) The Staff

Fall—as arranged; spring—as arranged. Registration limited to students with at least a B average who have had a seminar or comparable course in field of proposed research. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day. Registration permitted for one semester only; work must be completed within the semester and paper submitted not later than last day of classes.

475 *Taxation—Corporate* (2) Hambrick

Fall—evening. Analytical study of income tax problems in corporate dividends and distributions in redemption of stock; corporate liquidations; reorganizations, mergers, and acquisitions; recapitalizations; organization and sales of corporate businesses; collapsible corporations; carryovers. Prerequisite: Law 279.

480 *Taxation—Oil and Gas* (2) Hambrick

Spring—evening. A study of the application of the Federal income tax to the producing segment of the oil and gas industry; common types of interests in producing properties; tax treatment of exploration expenditures; intensive study of problems in the deduction of intangible development and drilling costs; the concept of "economic interest"—who is entitled to depletion?; tax distinctions between leasing transactions, sharing transactions, and sales of oil and gas properties and prospects; "ABC" transactions; organizational problems in oil and gas ventures—joint operating agreements, general and limited partnerships, associations taxable as corporations and pooling arrangements; "carried interests" and other financial arrangements in development of oil and gas properties. Prerequisite: Law 279.

485 *Taxation Seminar* (2) Hambrick

Spring—evening. Selected problems in federal income, estate and gift taxation, involving factual analysis and legal research, and the preparation of memoranda of law, legislative drafting or other appropriate disposition. Identical problems or cases will be assigned to small groups for development and disposition. Registration subject to approval of teacher. Prerequisite: Law 274 and 279.

492 *Trade Regulation Seminar* (2) Weston

Spring—evening. Group study of current problems relating to unfair trade practices and federal antitrust laws.

495 *Urban Redevelopment* (2) Orentlicher

Spring—evening. Selected problems in urban redevelopment and housing, with particular emphasis on programs under current federal and state legislation.

MATHEMATICS*

Professors J. H. Taylor (*Emeritus*), F. E. Johnston, Florence Mears, N. D. Nelson
(Executive Officer), T. P. G. Liverman, N. A. Wiegmann
Professorial Lecturers W. H. Marlow, D. M. Dribin
Assistant Professors W. A. Smith, R. Z. Vause
Lecturers J. P. Fennell, Mabel Morris, E. L. Williams

Bachelor of Arts or Bachelor of Science with a major in Mathematics (Columbia College—Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, see pages 51 and 52.

Required: in addition to the general requirements of Columbia College as stated on pages 61–65, fifteen semester hours of Mathematics of approved second- and third-group courses.

Master of Arts or Master of Science in the field of Mathematics (Columbia College).—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively, with a major in Mathematics at this University, or the equivalent.

Required: the general requirements of Columbia College as stated on pages 66–69.

Doctor of Philosophy (Graduate Council).—See page 74.

Bachelor of Science in Engineering with an option in Mathematics (School of Engineering).—For requirements see pages 100–102 and 104–5.

Bachelor of Arts in Education with a teaching field in Mathematics (School of Education).—Prerequisite: the Education curriculum in the Junior College, pages 53–54.

Required: the Mathematics option and the professional courses listed in the School of Education Catalogue.

FIRST GROUP†

2 *General Mathematics* (3)

Fall—evening; spring—evening. For students in the School of Education. A study of basic concepts of elementary mathematics: propositional logic, mathematical proof, number systems, number notations, functions, computations in arithmetic and algebra, and geometric measurement. Smith

3 *College Algebra* (3)

Fall—morning and evening; spring—morning and evening; summer 1961. Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry. The Staff

6 *Plane Trigonometry* (3)

Fall—morning and evening; spring—morning and evening; summer 1961. Prerequisite: two years of high school algebra and one year of high school geometry, or Mathematics 3 (or concurrent registration therefor). The Staff

12 *Analytic Geometry* (3)

Fall—morning and evening; spring—morning and evening; summer 1961. Prerequisite: Mathematics 3 and 6, or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry. The Staff

29 *Calculus I* (3)

Fall—morning and evening; spring—morning and evening; summer 1961. Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite or concurrent registration: Mathematics 12. The Staff

* The Staff of Instruction here listed is for the academic year 1960–61.

† No first-group course in mathematics is available for college credit if the student's previous training in mathematics meets the prerequisite for a higher numbered course.

- 30 *Calculus II* (3) The Staff
Fall—morning and evening; spring—morning and evening; summer 1961. Differentiation and integration of transcendental functions with applications, methods of integration, vectors and parametric equations. Prerequisite: Mathematics 12 and 29.
- 31 *Calculus III** (3) The Staff
Fall—morning and evening; spring—morning and evening; summer 1961. Infinite series, partial differentiation, multiple integrals, solid geometry, improper integrals, and differential equations. Prerequisite: Mathematics 30 (or concurrent registration therefor), or Mathematics 20.

SECOND GROUP*

- 101 *Introduction to Mathematical Logic* (3) Nelson
Fall—evening. Development of propositional and predicate calculi, basic semantic concepts, elementary intuitive set theory, Boolean algebra. Prerequisite: Mathematics 31 (or 20) or Philosophy 121.
- 102 *Fundamental Concepts of Mathematics* (3) Nelson
1962-63 and alternate years. Axiomatic set theory, cardinal and ordinal arithmetic, foundations of the real number system. Prerequisite: Mathematics 101 or permission of the instructor.
- 106 *Topology for Undergraduates* (3)
Fall—evening.
- 111 *Mathematics for Engineers and Physicists I* (3) The Staff
Fall—morning and evening; spring—morning and evening; summer 1961. Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 30 and 31.
- 112 *Mathematics for Engineers and Physicists II* (3) The Staff
Fall—morning and evening; spring—morning and evening; summer 1961. Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 111 or 132.
- 120 *Introduction to Theory of Numbers* (3) Vause
Fall—evening.
- 122 *Introduction to Abstract Algebra* (3) The Staff
Spring—morning; summer 1961.
- 123 *Theory of Equations* (3) The Staff
Fall—morning.
- 124 *Introduction to Matrix Theory* (3) Wiegmann
Fall—evening. Elementary theory of finite vector spaces, determinants, equivalence, matrices with polynomial elements, similarity of matrices.
- 125 *Advanced Algebra* (3)
Not offered 1961-62.
- 126 *Advanced Analytic Geometry* (3) Taylor
Not offered 1961-62.
- 132 *Differential Equations* (3)
Not offered 1961-62.
- 134 *Introduction to Boundary Value Problems* (3) The Staff
Spring—evening. Prerequisite: Mathematics 111, 132, or 142.
- 135 *Projective Geometry* (3) Nelson
Not offered 1961-62.

* Mathematics 31 (or 20) is prerequisite to all second-group courses.

- 139 *Advanced Calculus I* (3) The Staff
 Fall—evening; spring—morning; summer 1961. Limits, continuity, real number system, mean value theorems, partial differentiation, implicit function theorems, transformations, and mappings.
- 140 *Advanced Calculus II* (3) Mears
 Spring—evening. Vector fields, multiple integrals, line and surface integrals, point set theory, theory of integration, improper integrals. Prerequisite: Mathematics 139.
- 141 *Introduction to Infinite Series* (3) Mears
 Not offered 1961-62.
- 142 *Theory of Differential Equations* (3) Liverman
 Fall—evening. Prerequisite: Mathematics 139.
- 167 *Fourier Series and Spherical Harmonics* (3)
 Not offered 1961-62. Prerequisite: Mathematics 103, 111, or 132.
- 171 *Vector Analysis* (3) The Staff
 Fall—morning; spring—evening.

THIRD GROUP

- 201-2 *Mathematical Logic* (3-3) Nelson
 1961-62 and alternate years: academic year—evening.
- 220 *Theory of Numbers* (3) Vause
 1961-62 and alternate years: spring—evening.
- 237-38 *Theory of Functions of a Complex Variable* (3-3) Johnston
 A year course: credit is not given for the first half until the second half is completed.
 1961-62 and alternate years: academic year—evening.
- 242 *Infinite Series* (3) Mears
 Not offered 1961-62.
- 243-44 *Numerical Analysis* (3-3) Marlow
 1961-62 and alternate years: academic year—evening. Prerequisite: Mathematics 103, 111, 132, or 142.
- 249 *Ordinary Differential Equations* (3)
 Not offered 1961-62.
- 250 *Integral Equations* (3)
 Not offered 1961-62.
- 251-52 *Theory of Functions of a Real Variable* (3-3) Liverman
 A year course: credit is not given for the first half until the second half is completed.
 1962-63 and alternate years.
- 255 *Differential Geometry* (3)
 Not offered 1961-62.
- 257 *Theory of Groups* (3) Johnston
 Not offered 1961-62.
- 261 *Generalized Functions and Operational Methods* (3) Liverman
 Fall—evening. Theory of generalized functions in one variable. Operational calculus of generalized functions. Applications to differential equations and Fourier analysis. Prerequisite: Mathematics 140.
- 262 *Advanced Operational Methods* (3) Liverman
 Spring—evening. Generalized functions on test spaces of analytic functions. Operational calculus in several variables. Applications to partial differential and convolution equations of applied mathematics. Prerequisite: Mathematics 261.

- 265-66 *Modern Algebra* (3-3) Wiegmann
1962-63 and alternate years. Fundamental concepts of theory of groups, rings, and fields. Theory of finite fields, extension fields, Galois groups, factorization theory in Gaussian domains, and groups with operators.
- 267 *Topics in Matrix Theory* (3) Wiegmann
Spring-evening. Theory of linear transformations (vector spaces over a division ring), advanced classical theory, matrix representation of groups and rings, special topics as time allows. Prerequisite: Mathematics 124 and an elementary knowledge of groups, rings, and fields.
- 268 *Calculus of Variations* (3) Saaty*
Fall-Saturday morning.
- 270 *Tensor Analysis* (3)
Not offered 1961-62.
- 272 *Hilbert Space* (3)
Not offered 1961-62.
- 277 *Partial Differential Equations* (3)
Not offered 1961-62.
- 278 *Introduction to Topology* (3)
1962-63 and alternate years.
- 295-96 *Reading and Research* (3-3) The Staff
Academic year—as arranged; summer 1961.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1961.

MEDICINE†

- Professors T. M. Brown (*Executive Officer*), M. J. Romansky, L. K. Alpert, J. M. Evans
- Clinical Professors C. R. L. Halley, C. B. Ethridge
- Associate Professors A. E. Parrish, C. R. Hartman
- Associate Clinical Professors Pearl Holly, J. J. Feffer, A. G. Prandoni, Halla Brown, O. R. Farley, D. C. Sun, Janet Travell
- Assistant Professors S. W. Bush, W. R. Felts, Jr., G. A. Kelser, Jr., M. H. Jacobson, H. H. Orvis, Irene Siu, R. C. Fowler
- Assistant Clinical Professors J. A. Reed, T. J. Abernethy, Benjamin Manchester, L. G. Lederer, J. E. Smith, J. W. Trenis, L. E. Putnam, Elizabeth Hill, J. E. Rall, L. J. Thomas, M. H. Stolar, Alfred Brigulio, T. S. Sappington, S. J. N. Sugar, Joseph Ney, Joseph Beinstein, F. S. Bacon, H. D. Ecker, J. J. Rheingold, Irene Tamagna, J. W. Latimer, Jr., C. W. Jones, C. W. Thompson, E. S. Gladsden, Maurice Mensh, Arthur Rosenbaum, F. J. Murray, E. P. Parker III, M. H. Rosenberg, J. W. DuChes, W. O. Bailey, Jr., Milton Gusack, Jack Kleh, T. A. Gonder, Rashid Massumi
- Associates Maurice Protas, R. B. Castell, S. T. Gibson, R. B. Miller, Ernest Cotlove, T. J. Kennedy, Jr., Jack Orloff, J. B. Marbury, Louis Ross, F. D. Chapman, L. H. Snyder, R. G. Taylor, J. W. Long, Irvin Kerlan, Virginia Beelar,

* Appointment effective September 1961.

† The Staff of Instruction here listed is for the academic year 1960-61.

L. S. Blumenthal, S. W. Kirstein, J. F. Ambury, R. N. Coale, Israel Kessler, W. D. Brill, Marvin Fuchs, W. J. Weaver, Jr., Ruth Benedict, H. M. Silver, J. T. Burns, T. L. Hartman, Boris Rabkin, M. H. Rose, C. A. Schulman, L. A. Craig, Jr., A. W. Danish, Adolph Friedman, Alvin Seltzer, S. D. Loube, Alfred Baer, Herbert Abramson, H. K. Beye, J. H. Pert, John Walsh, C. E. Law, E. L. Rea, J. P. Mann, Conrad Gossels, J. E. Chapman, H. O. Mott, Bertle Nelson, H. E. Ticktin, W. J. Schewe, J. H. Watson, N. H. Rubenstein, D. M. Watkin, Edward Adelson, G. J. Fisher, W. L. Stone, B. H. Ostrow, C. D. Cooper, R. R. Belton, S. C. Pascoe, W. R. Ehrmantraut

Clinical Instructors E. H. Bauersfeld, H. C. Bates, Jr., Jeanne Bateman, George Sharpe, William Lewis, M. A. Sislen, C. J. Savarese, Jr., B. R. Cooperman, M. G. Sherer, Jacob Robbins, J. C. Mandes, R. L. Howard, Walter Kurland, E. J. Leonard, R. S. Gordon, Jr., Jack Crowell, D. S. Davis, J. W. Roark, J. H. Epstein, G. C. Buchanan, F. K. Harris II, Audrey Connor, H. I. Passes, C. W. Foulke, Margret McCabe, A. A. Lear, E. H. Levine, O. W. Donnelly, R. F. Dyer, R. S. Poole, P. R. Vagelos, A. D. Merritt, H. C. Sadin, S. J. Talpers, G. I. Shugoll, G. T. Economos, Irwin Ardham, S. W. Dejter, Victor Schocken, S. E. Barr, H. A. Moskowitz

Special Lecturers A. D. Kistin, W. K. Myers, Sol Katz, R. W. Berliner, Henry Field, Jr., T. H. McGavack, P. D. Comanduras, W. L. Nalls, Roy Hertz, Albert Sjoerdsma, W. H. Crosby, D. S. Fredrickson, Pierre Tulou, J. L. Goddard

106 *Living Anatomy*

Spring—1 hour a week. An introduction to physical diagnosis, with special emphasis on topographical anatomy. The Staff

236 *Clinical Microscopy*

Spring—3 hours a week. Conferences and studies in the clinical application of laboratory examinations of blood, body fluids, exudates, excreta. The Staff

242 *Physical Diagnosis*

Spring—6 hours a week. Covers not only theoretical but practical application of principles of physical diagnosis as related to examination of patients. The Staff

243-44 *Introduction to Medicine*

Academic year—2 hours a week. Lectures covering the principles of internal medicine preparatory to clinical studies and training in the inpatient and out patient services. The Staff

325-26 *Clinical Clerkship*

Eight weeks as arranged during academic year. Training with bed patients under individual instruction designed to develop ability in examination of patients and case taking as well as practice in clinical microscopy. D. C. General Hospital. The Staff

327 *Clinical Pathological Conferences I*

Fall—1 hour a week. Conferences are held at the School of Medicine. Case histories are presented and discussed by the students and members of the Staff. Clinical, laboratory, and necropsy findings are compared. The Staff

339-40 *Therapeutic Conferences*

Academic year—1 hour a week. Conferences designed to emphasize the application of pharmacological principles to the problems of clinical medicine. University Hospital. The Staff

349-50 *Medical Conferences*

Academic year—2 hours a week. D. C. General Hospital.

- 421-22 *Outpatient Clinics* The Staff
Six weeks as arranged during academic year. Individual case studies under personal supervision of the Staff. Daily clinics on current medical problems and seminars stressing physiological aspects of diseases. Individual examinations and instruction in medical specialties. University Hospital.
- 423-24 *Clinical Clerkship* The Staff
Six weeks as arranged during academic year. University, Mt. Alto, and D. C. General hospitals.
- 427-28 *Clinical Pathological Conferences II* The Staff
Academic year—1 hour a week. Continuation of Medicine 327.
- 429-30 *Clinical Pathological Conferences III* The Staff
Academic year—1 hour a week. Conferences are held at the University Hospital. Attendance is required of students during their medical clerkships there.

MICROBIOLOGY AND COMMUNITY HEALTH*

Professors L. W. Parr (*Emeritus*), A. M. Griffin, H. L. Ley, Jr. (*Executive Officer*), Mary Robbins
Clinical Professor R. G. Beachley
Associate Professor Rudolph Hugh
Assistant Professors W. G. McCarten, R. C. Wood
Clinical Instructor A. H. Traum
Associates W. D. Hann, G. B. Pelleu, Jr.

Special Lecturers S. J. Ajl, L. S. Baron, R. C. Cook, C. W. Emmons, J. L. Goddard, F. B. Gordon, Murray Grant, Leon Jacobs, M. C. Leikind, J. D. MacLennan, H. J. Magnuson, W. J. Peeples, G. O. Pierce

Master of Arts or Master of Science in the field of Microbiology (Columbian College).—Prerequisite: a Bachelor of Arts or a Bachelor of Science degree, respectively, from this University, or the equivalent, with a major in Biology, Botany, Chemistry, or Zoology. The undergraduate program must include the following courses or the equivalent: Chemistry 11-12, 21, 22, 151-52; Physics 11, 12; Zoology 1-2, 41-42.

Required: the general requirements of Columbian College as stated on pages 66-69. The thirty semester hours must include (if not presented for admission) Microbiology 112, 210, 249-50, 293-94, 299-300 and Biochemistry 221-22. The remaining courses are to be selected from Microbiology 209, 219-20, 230, 232, 234, 240 and 295-96. The student with much bacteriological background may substitute for credit one or more courses from the following: cytology, genetics, cell physiology, entomology, histology, biostatistics, and protozoology. It is not always possible to arrange courses and research so that the student can be assured of completing all required work in one academic year.

Doctor of Philosophy (Graduate Council).—See page 74.

101 *Biostatistics (1)* Griffin
Fall—Sat., 11:00 A.M. The meaning and use of statistical terms and methods pertinent to the design of experiments and the interpretation of the results obtained in laboratory, clinical, and field trials.

112 *General Microbiology (4)* Hugh
Spring—Mon., Wed., and Fri., 9:10 to 12:00 A.M. For nonmedical students. A study of the fundamentals of bacteriology, including hygienic applications. Methods of cultivation and control of several groups of microorganisms are studied in the laboratory. Prerequisite: any biological laboratory science; Chemistry 11-12. Laboratory fee, \$13.

* The Staff of Instruction here listed is for the academic year 1960-61.

209 Medical Microbiology (1 to 11)

Ley and Staff

Fall: lecture (4 hours), laboratory (10 hours)—as arranged. Bacteria, rickettsia, viruses, yeasts, molds, protozoa, and metazoa which relate to the health and diseases of man—cultural study of most important forms; methods of diagnosis by microscopic, cultural, immunologic, and animal reactions; theory and methods of immunology; vaccines; serums; antibiotics. Open to suitably prepared graduate students; may be elected as a whole or in part by adding the appropriate letter to the course number, with credit allocated as follows: (a) *Bacteriology*, including rickettsia and viruses—lecture (4), laboratory (3); (b) *Parasitology*, including medical mycology—lecture (2), laboratory (1); (c) *Immunology* (1). May be taken by a limited number of candidates for Master's degrees. Laboratory fee, \$4.50 for each semester hour of laboratory work.

210 Fundamentals of Epidemiology and Preventive Medicine (2)

Ley and Staff

Spring—Mon., 2:00 to 4:00 P.M. Sources, modes, and implications of infection and injury. Consideration also given the problem of accidents and industrial medicine. Open to liberal arts graduate students. Prerequisite: Bacteriology 112 to 209.

219-20 Advanced Microbiology (arr.)

Hugh and Staff

Academic year—as arranged. Special study of advanced methods and current problems in microbiology for suitably qualified students specializing in microbiology. Prerequisite: Bacteriology 112 to 209; Chemistry 151-52 or the equivalent; permission of the instructor. Laboratory fee, \$4.50 a semester hour.

230 Statistics in Microbiology (3)

Griffin

Spring—as arranged. The application of statistical methods to the problems of microbiology. For graduate students. Prerequisite: elementary college algebra.

232 Immunological Methods (3)

The Staff

1962-63 and alternate years: spring—as arranged. Preparation and testing of serological materials. Demonstration of basic serological phenomena. For graduate students. Prerequisite: Microbiology 112 or 209 and permission of the instructor. Laboratory fee, \$11.

234 Virology (6)

Robbins

1961-62 and alternate years: spring—as arranged. Study of viruses and rickettsiae. Lectures and laboratory exercises. For graduate students. Prerequisite: Microbiology 112 or 209 and permission of the instructor. Laboratory fee, \$16.

240 Advanced Epidemiology and Public Health (3)

Ley

Spring—as arranged. Conferences, readings, and problems for graduate students dealing with specialized and advanced phases of the topics presented in Microbiology 210. Prerequisite: Microbiology 210.

249-50 Introduction to Medical Research* (3-3)

The Staff

Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

293-94 Staff Seminar (1-1)

The Staff

Academic year—as arranged. For graduate students. Bi-weekly throughout the year.

295-96 Research in Microbiology (arr.)

The Staff

Academic year—as arranged.

299-300 Thesis (3-3)

The Staff

401 Public Health Practice

Beachley and Staff

Fall—1 hour a week for 5 weeks. Study of public health practice at national, state, city, and county levels. Public and private agencies.

* This is an interdepartmental course. The student should register in the department directing his research.

NEUROLOGY AND NEUROLOGICAL SURGERY*

Professors J. W. Watts (*Executive Officer*), Harold Stevens
 Clinical Professor H. D. Shapiro
 Associate Clinical Professors R. H. Groh, J. M. Williams
 Assistant Clinical Professors J. P. Murphy, H. V. Rizzoli, A. S. Dekaban, Paul
 Chodoff
 Associates G. D. Weickhardt, Harvey Ammerman, G. J. Hayes, C. A. Marsan, A. J.
 Levens
 Clinical Instructors M. C. Korengold, J. T. Lord, N. H. Horwitz, Z. W. Sanders,
 Ntinos Myrianthopoulos, R. H. Robertson, R. A. Mendelsohn, Ruth Jakoby, Vir-
 ginia Duggins

Special Lecturer S. S. Kety

249 *Neurology: Basic* Stevens, Williams
 Fall—1 hour a week. Methods used to study the form and function of the nervous system. Lectures and laboratory demonstrations.

250 *Neurology* Stevens and Staff
 Spring—1 hour a week. Introductory lectures on clinical neurology with speci-
 mens, lantern slides, and motion pictures.

331 *Neurology and Neurological Surgery* Watts, Stevens
 Fall—1 hour a week. Clinical lectures and demonstrations.

333-34 *Neurology and Neurological Surgery, Clinical Clerkship* Stevens, Williams,
 Ammerman
 In conjunction with Neurology 335-36. Two weeks in rotation as arranged during
 academic year. Instruction in history, physical examination, ordinary clinical
 procedures. Attendance at neurosurgical operations. Six students in rotation. D. C.
 General Hospital.

335-36 *Neurosurgical Conferences* Watts and Staff
 Clinical conferences weekly. Six students in rotation. D. C. General Hospital.

431-32 *Neurology and Neurological Surgery Clinic* Levens, Rizzoli
 Two hours a week for three weeks in rotation as arranged during academic year.
 Neurological outpatient clinic. Consultation of staff on ambulatory cases, demon-
 stration of diagnostic procedures. Six students in rotation. University Hospital.

433-34 *Clinical Neurology* Groh, Sanders
 Two hours a week for three weeks in rotation as arranged during academic year.
 Neurological inpatient examinations and demonstrations. Six students in rotation.
 St. Elizabeths Hospital.

435-36 *Neurological Surgery (elective)* The Staff
 Academic year—bi-monthly. Lectures and motion picture demonstration of neuro-
 surgical problems

* The Staff of Instruction here listed is for the academic year 1960-61.

OBSTETRICS AND GYNECOLOGY*

Professors John Parks, R. H. Barter (*Executive Officer*)

Clinical Professors H. L. Darner, George Nordlinger

Associate Clinical Professor S. M. Dodek

Assistant Professors J. G. Sites, W. P. McKelway

Assistant Clinical Professors J. K. Cromer, J. A. Dusbabek, C. K. Fraser, Caroline Jackson

Associates B. W. Richwine, F. S. Rogers, R. M. Roll, W. T. Lady, J. W. Pearson, Jr., T. M. Leonard, Shirley Martin, N. J. Price, T. A. Wilson

Clinical Instructors J. R. Epstein, M. S. Kaufman, S. H. Shea, A. S. Bright, R. E. Bieren, M. P. Footer, Donald Walters, J. M. Friedman, L. M. Liverett, W. H. Cooper, Peter Soyster, H. P. Treichler, J. C. Walsh, I. W. Rovner, M. W. Sandmeyer, Jr., N. M. Tart, Elizabeth Crisp, L. W. Davis

254 *Introduction to Obstetrics and Gynecology* Dodek, Fraser
Spring—1 hour a week. Lectures and demonstrations on the development and physiology of the female reproductive system and the management of normal pregnancy.

301-2 *Manikin Demonstrations* Footer, Friedman
One hour a week for eight weeks in rotation as arranged during academic year. The mechanism of labor and various types of operative delivery demonstrated to sections of the junior class. D. C. General Hospital.

337-38 *Obstetrics and Gynecology* Parks, Barter, Sites, McKelway
Academic year—2 hours a week. Lectures and demonstrations on the principles of obstetrics and gynecology.

351-52 *Clinical Clerkship* The Staff
Four weeks during academic year as arranged. Clerkship with patients, including ward rounds, operating room demonstrations, and weekly clinic. D. C. General Hospital.

439-40 *Clinic in Obstetrics and Gynecology* Barter, Sites, McKelway
Two hours a week for eight weeks in rotation as arranged during academic year. Student presentation and discussion of patient problems. Demonstration of equipment used in obstetric and gynecologic practice.

441-42 *Clinical Obstetrics* The Staff
Academic year—as arranged. Students participate in prenatal and postnatal clinic care, observe the course of labor and deliver patients under supervision, attend bi-weekly departmental conferences and daily ward rounds in the University and D. C. General hospitals.

443-44 *Clinical Gynecology* The Staff
Eight weeks in rotation as arranged during academic year. Students observe and participate in the gynecological clinics and operating rooms of the University and D. C. General hospitals.

* The Staff of Instruction here listed is for the academic year 1960-61.

OPHTHALMOLOGY*

Professor R. A. Cox (*Executive Officer*)

Clinical Professor E. A. W. Sheppard

Assistant Clinical Professor R. W. Wilkinson

Associates W. J. Romejko, W. P. Chalfant, Jr., W. J. G. Davis, R. E. duPrey, Robert Day, M. G. Alper

Clinical Instructors J. H. Lodge, W. B. Glew, J. R. Weimer, J. W. McTigue

352 Ophthalmology

The Staff

Spring—one hour a week for sixteen weeks as arranged. Lecture course presenting aspects of all the principles of ophthalmology.

447-48 Clinic

The Staff

Academic year—as arranged. Each student is given individual instruction in ophthalmological diagnosis.

OTOLARYNGOLOGY*

Associate Clinical Professor J. J. McFarland, Jr. (*Executive Officer*)

Assistant Clinical Professors Catharine Birch, J. L. Levine

Associates M. E. Krucoff, W. B. Walters, R. S. Page, Jr., J. A. Sabri, W. M. Tribble

351 Otolaryngology

The Staff

Spring—1 hour a week for fourteen weeks. Lectures and demonstrations on anatomy, physiology, and diseases of the ear, nose, and throat.

354 Bronchoscopy

The Staff

Spring—1 hour a week for two weeks. A series of lectures on the fundamental principles and the use of instruments, including both the bronchoscope and esophagoscope.

355-56 Clinic

The Staff

One and one-half hours a week in rotation as arranged during academic year. Practical clinical instruction in the diagnosis and treatment of diseases of the ear, nose, and throat. D. C. General Hospital.

PATHOLOGY*

Professor T. M. Peery (*Executive Officer*), W. R. Duryee (*Research*)

Clinical Professor D. L. Weias

Associate Professors F. N. Miller, Jr., William Newman, W. L. Marsh

Assistant Professor Lois Platt (*Cytology*)

SPECIAL STAFF FOR DEMONSTRATIONS

Associate Clinical Professors J. S. Howe, E. F. Geever

Assistant Clinical Professors R. G. Gottschalk, R. E. Palmer, W. F. Enos, Cornelia Hoch-Ligeti

Associates L. E. Zimmerman, L. W. Fix, C. B. Cook

Clinical Instructors C. P. Barnett, D. R. Parkinson

* The Staff of Instruction here listed is for the academic year 1960-61.

Special Lecturers E. B. Helwig, L. C. Johnson

Bachelor of Science in Medical Technology (Columbian College—Departmental)—Prerequisite: the Medical Technology curriculum in the Junior College, see page 53, including Chemistry 11-12, Zoology 1-2, and Microbiology 112.

Required: the general requirements of Columbian College as stated on pages 61-65, including Chemistry 21 and 22, and the following second-group courses offered in the University Hospital. Pathology 115-16, 117-18, and 119.

Admission to the Medical Technology Course does not assure admission to the Hospital program. (See "Medical Technology Course", pages 85 and 86.)

115-16 Introduction to Medical Science (1-1) Marsh and Staff
Academic year—1 hour a week. For students in medical technology at the University Hospital. These lectures, based upon physiology, pathology, and medicine, provide a background for the interpretation of laboratory data.

117-18 Principles in Medical Technology (4-4) Marsh and Staff
Academic year—4 hours a week. For students in medical technology at the University Hospital. Theories, principles, and sources of error, of the methods used in clinical chemistry clinical bacteriology, serology, hematology, and clinical microscopy.

119 Medical Technology Laboratory (20) Marsh and Staff
30 hours a week for 50 weeks. Practice and experience by rotation through the various divisions of the Pathology laboratories of the University Hospital, as follows: hematology and urinalysis, 12 weeks; chemistry, 12 weeks; bacteriology and parasitology, 10 weeks; blood bank, 8 weeks; serology, 4 weeks; tissue pathology, 4 weeks.

259-60 Pathology Peery, Miller
Fall—9 hours a week; spring—3 hours a week. General pathology of inflammations, degenerations, malformations, and neoplasms. Special pathology of the organs and specific diseases. The laboratory work consists of the gross and microscopic study of diseased tissue. Special emphasis is placed on the functional effects of the various pathologic changes and their correlation with symptoms and physical signs.

261-62 Necropsy The Staff
Academic year—as arranged. Students are required to attend and assist in the performance of necropsies at the University Hospital.

263-64 Demonstrations in Pathology Special Staff
Academic year—1 hour a week. Gross specimens from several hospitals are demonstrated and discussed.

267-68 Seminars in Pathology Special Lectures
Academic year—as arranged. Advanced lectures are presented as arranged on special topics in pathology.

270 Forensic Pathology and Medical Jurisprudence Miller
Spring—1 hour a week. Forensic pathology, toxicology, chemistry, and immunology. The legal and ethical rights and responsibilities of physicians. Legal problems in medicine.

323-24 Surgical Pathology I Weiss
Academic year—1 hour a week. Weekly conferences are held with the student group assigned to the surgical clerkship, reviewing current surgical specimens.

327 Clinical Pathological Conferences I The Staff
Fall—1 hour a week. Conferences are held at the School of Medicine. Case histories are presented and discussed by the students and members of the Staff. Clinical, laboratory, and necropsy findings are correlated.

427-28 Clinical Pathological Conferences II The Staff
Academic year—1 hour a week. Continuation of Pathology 327.

- 429-30 *Clinical Pathological Conferences III* The Staff
Academic year—1 hour a week. Conferences are held at the University Hospital.
Attendance is required of students during the medical clerkship there.
- 492 *Surgical Pathology II* Newman
Spring—1 hour a week. A systematic study of the gross and microscopic changes in the organs and tissues commonly removed surgically.
- 493-94 *Pathology Clerkship (elective)* The Staff
Academic year—as arranged. A limited number of students receive training in surgical pathology and necropsies in the laboratories of the University Hospital.

PEDIATRICS*

Clinical Professors Margaret Nicholson, Edward Lewis, W. S. Anderson, R. H. Parrott, L. E. Hoeck
Associate Clinical Professors J. A. Washington, R. S. Lourie, T. E. Reichelderfer, W. A. Howard (*Executive Officer*)
Assistant Clinical Professors Margaret Gutelius, Mabel Grosvenor, Aaron Nimetz, George Maksim
Associates J. H. Peacock, Jr., M. I. Cohen, Mary Sartwell, A. B. Coleman, C. F. Stiegler, H. G. Clark, Adrian Recinos, Jr., R. E. Martin, C. R. Webb, William Stark, A. R. MacPherson, S. L. Leikin
Clinical Instructors H. H. Diamond, R. H. Mitchell, R. O. Warthen, Emilie Black, R. H. Anderson, W. G. Preisser, Bennett Olshaker, H. T. Yates, Roger Bergstrom, G. J. Cohen, M. S. Glatt, Mary Fox, J. L. Hatleberg, S. Z. Goldblatt, Hilary Millar, Harold Plotsky, A. J. Modlin, J. R. Puig, M. I. Mones, Jean Lockhart, W. N. Sterling, G. W. Daisley, Jr., Gloria Eng, Belinda Straight, Jean Yacoubian

Special Lecturer M. E. Wegman

- 256 *Pediatrics* Howard and Staff
Spring—2 hours a week. Lectures on physiology of the newborn, normal behavior, emotional and physical development, infant nutrition, diseases of the newborn, common anomalies and system illnesses of infancy and childhood. Medical School.
- 355-56 *Pediatrics* Howard and Staff
Continuation of 256, with increasing emphasis on pathologic disease states, stressing pathophysiology and treatment.
- 357-58 *Clinical Clerkship: General Pediatrics* Reichelderfer and Staff
Two weeks as arranged during academic year. Introduction to clinical pediatrics. Emphasis on bedside discussion and group seminars including the newborn. Ward rounds. Five students in rotation. D. C. General Hospital.
- 359-60 *Clinical Clerkship: Contagious Diseases* Reichelderfer and Staff
Two weeks as arranged during academic year. Conferences and bedside discussion on contagious and infectious diseases. Prevention and quarantine measures. Five students in rotation. D. C. General Hospital.
- 361-62 *Clinical Conferences I* Reichelderfer and Staff
Academic year—1 hour a week. Required. Presentation and discussion by students of current patient problems. D. C. General Hospital.

* The Staff of Instruction here listed is for the academic year 1960-61.

- 363-64 *Ward Rounds* Reichelderfer, Sterling, and Staff
Academic year—as arranged. Bi-weekly ward rounds, with students and Resident Staff. D. C. General Hospital.
- 365-66 *Psychiatry* Lourie and Staff
Academic year—as arranged. Lectures on neuroses of children and adolescents (in cooperation with the Department of Psychiatry).
- 457-58 *Clinical Clerkship* Howard and Staff
Six weeks as arranged during academic year. Full time, including assignment to night and holiday admissions. Case studies on wards under direct Resident supervision. Ward rounds with Staff and Residents. Twelve students. Children's Hospital.
- 459-60 *Outpatient Clinics* Howard and Staff
Academic year—as arranged. Work in Medical and Specialty clinics including surgery, allergy, X-ray, child welfare, cardiology, dermatology, neurology, and child guidance. Children's Hospital.
- 461-62 *Clinical Pathological Conferences* Howard and Staff
Academic year—1 hour a week. Clinical and pathological discussion of recent patient history and laboratory data. Medical School.
- 463-64 *Teaching Rounds* Gutelius and Staff
Academic year—three times a week. Discussion of clinical problems of diagnosis and treatment of current patients. Children's Hospital.
- 465-66 *Section Conferences* The Staff
Academic year—1 hour a week. Surgical diagnosis, pre- and post-operative management. Children's Hospital.
- 467-68 *Clinical Conferences II* Howard and Staff
Academic year—1 hour a week. Required. Staff and student discussion of current problems in pediatrics with review of recent literature. Children's Hospital.
- 469-70 *Clinical Pediatric Psychiatry* Lourie and Staff
Academic year—as arranged. Clerkship in fourth year including Well Baby Clinic. Group and class conferences.

PHARMACOLOGY*

Professor H. G. Mandel (*Executive Officer*)

Clinical Professor R. G. Smith

Professorial Lecturer B. B. Brodie

Associate Professors Clarke Davison, R. M. Wiedersheim (*Research*)

Assistant Professors P. B. Danneberg, Ariel Hollinshead (*Research*), Melvin Reich (*Research*), J. F. Henderson (*Research*), George Fiala (*Research*)

Special Lecturer W. V. C. Leahy

Master of Arts or Master of Science in the field of Pharmacology (Columbia College).
—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively. The undergraduate program must include the following courses or the equivalent: Biology 1-2 or Zoology 1-2; Physics 12, 13, 16; Chemistry 11-12, 22, 151-52. Biochemistry 221-22 and Physiology 115, 117 are recommended as the undergraduate electives if the candidate wishes to complete the work for the Master's degree in one year.

Required: the general requirements of Columbia College as stated on pages 66-69.

* The Staff of Instruction here listed is for the academic year 1960-61.

The thirty hours of required work must include Biochemistry 221-22; Physiology 115, 117; Pharmacology 261, 263, 267-68, 269-70, 299-300. The remaining courses may be selected from Biochemistry 224, 225-26, 232; Physiology 150; Microbiology 112, 209, 230; Pharmacology 280.

Master of Arts or Master of Science in the field of Chemotherapy (Columbian College). Prerequisite: a Bachelor of Arts or a Bachelor of Science degree, respectively. The undergraduate program must include the following courses or the equivalent: Biology 1-2 or Zoology 1-2, 41-42; Physics 12, 13; Chemistry 11-12, 22, 151-52. Biochemistry 221-22 is recommended as an undergraduate elective if the candidate wishes to complete the work for the Master's degree in one year.

Required: the general requirements of Columbian College as stated on pages 66-69, including Microbiology 112; Biochemistry 221-22; Pharmacology 262, 267-68, 269-70, 299-300. The remaining courses may be selected from Microbiology 209, 229, 230; Biochemistry 224, 225, 232; Physiology 115, 117; Pharmacology 261, 263.

Doctor of Philosophy (Graduate Council).—See page 74.

249-50 Introduction to Medical Research* (3-3)

The Staff

Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

261 Pharmacology (5)

The Staff

Fall—5 hours a week. Lectures and conferences concerning the interaction of drugs and biological systems as a basis for the rational therapy of disease. Open to qualified nonmedical students.

262 Chemotherapy (1)

The Staff

Spring—1 hour a week. Continuation of Pharmacology 261.

263 Pharmacology Laboratory (1)

The Staff

Fall—3 hours a week. Laboratory instruction and demonstrations designed to complement Pharmacology 261. Open to qualified nonmedical students.

267-68 Pharmacological Research (arr.)

The Staff

Academic year—as arranged. Primarily for those properly qualified graduate and medical students seeking careers in pharmacology.

269-70 Pharmacology Seminar (1-1)

The Staff

Academic year—2 hours a week. Recent advances in pharmacology. For those interested in pharmacological research. Open to qualified nonmedical students.

279-80 Mechanism of Drug Action

The Staff

Academic year—as arranged. A course to familiarize the student with advanced biochemical, microbiological and physiological methods employed in pharmacological investigations. Open to qualified nonmedical students.

299-300 Thesis (3-3)

The Staff

Academic year—as arranged. Required of Master of Arts and Master of Science candidates.

* This is an interdepartmental course. The student should register in the department directing his research.

PHARMACY*

Professor C. W. Bliven (Executive Officer)

Associate Professors R. M. Leonard, C. J. Kokoski, S. M. Schwartz

Assistant Professors F. D. Cooper, G. G. Koustenis

Special Lecturers W. S. Apple, G. F. Archambault, Karl Bambach, W. P. Briggs, C. J. Carr, E. G. Feldman, D. L. Finucane, L. E. Kazin, F. C. McAleer, M. L. Yakowitz

Bachelor of Science in Pharmacy (School of Pharmacy).—Prerequisite: the Pharmacy curriculum in the Junior College, see page 53. The requirements for the degree are stated on pages 116-19.

Master of Science in Pharmacy (School of Pharmacy).—Prerequisite: the degree of Bachelor of Science from an accredited institution. The requirements for the degree are stated on pages 120-21.

FIRST GROUP

1 *Introductory Pharmacy* (2)

Bliven

Spring: lecture and field trips—morning. Introduction to pharmacy through the study of professional areas in which pharmacists are employed. Field trips include visits to representative retail and hospital pharmacies, wholesale drug houses, and

~~pharmacies.~~

SECOND GROUP

101 *Inorganic Pharmaceutical Chemistry* (3)

Schwartz

Fall: lecture (2 hours)—morning, laboratory (3 hours)—afternoon. A study of the occurrence, methods of preparation, properties and uses of the important inorganic chemicals encountered in pharmacy and medicine. Prerequisite or concurrent registration: Chemistry 21. Laboratory fee, \$11.

102 *Dispensing Pharmacy* (4)

Kokoski, Koustenis

Spring: lecture (2 hours), laboratory (6 hours)—afternoon. Compounding of typical prescriptions and a study of incompatibilities. Prerequisite: Pharmacy 122; concurrent registration: Pharmacy 110. Laboratory fee, \$18.

103 *Dispensing Pharmacy* (4)

Kokoski, Koustenis

Fall: lecture (2 hours)—morning, laboratory (6 hours)—afternoon. Continuation of Pharmacy 102. Laboratory fee, \$18.

105-6 *Pharmacology I* (2-2)

Leonard

Academic year—afternoon. The general principles of pharmacology; drugs acting locally on skin and mucous membranes; drugs acting locally in the gastrointestinal tract; drugs affecting the blood and blood-forming organs; dietary adjuncts; drugs affecting water balance; anti-infectives; and their major clinical indications or therapeutic uses. Prerequisite or concurrent registration: Physiology 115 (fall); Microbiology 112 (spring).

107 *Pharmacy Accounting* (3)

Koustenis

Fall—morning. The financial records required in the operation of a pharmacy.

109 *First Aid* (1)

Fall—morning. Standard course in first aid methods and practice.

110 *Organic Pharmaceutical Chemistry* (3)

Schwartz

Spring—morning. A survey of important synthetic and naturally occurring medicinal agents in current use with emphasis on nomenclature, isolation or synthesis, properties, and structure-action relationship. Prerequisite: Chemistry 152.

111 *Organic Pharmaceutical Chemistry* (3)

Schwartz

Fall—morning. Continuation of Pharmacy 110. Prerequisite: Pharmacy 110.

* The Staff of Instruction here listed is for the academic year 1960-61.

- 112 Physical Pharmacy (4)** Schwartz
Spring: lecture (3 hours)—morning; laboratory (3 hours)—afternoon. Physicochemical principles and laws as they apply to pharmaceutical systems and preparations. Prerequisite: Pharmacy 101 and 110; concurrent registration: Pharmacy 111. Laboratory fee, \$11.
- 113 Organic Pharmaceutical Chemistry (1)** Schwartz
Laboratory (3 hours). Fall—afternoon; spring—afternoon. Preparation of selected official organic drugs. Prerequisite: Pharmacy 110. Prerequisite or concurrent registration: Pharmacy 111. Laboratory fee, \$11.
- 115 History of Pharmacy (3)** Bliven
Fall—morning. Historical development of the profession, including the literature, from ancient times to the present.
- 121-22 General Pharmacy (4-4)** Kokoski, Cooper, Schwartz
First half: fall—lecture (3 hours), laboratory (3 hours)—afternoon. Second half: spring—lecture (2 hours), laboratory (6 hours)—afternoon. Essential pharmaceutical processes; theory and manufacture of pharmacopeial and formulary galenical preparations; pharmaceutical usage of certain classes of substances and preparations. Laboratory fee: Pharmacy 121, \$11; Pharmacy 122, \$18.
- 125 Pharmaceutical Calculation (3)** Bliven
Fall—morning. Systems of weights and measures and their application in the practice of pharmacy.
- 126 Pharmacognosy (3)** Leonard
Spring—morning. Antibiotics, immunologic agents, allergens, hormones, vitamins, and pesticides. Prerequisite or concurrent registration: Microbiology 112; Physiology 115.
- 127 Pharmacognosy (3)** Leonard
Fall: lecture (2 hours)—morning; laboratory (3 hours)—morning and afternoon. Practices and procedures for the production, preservation, protection, and evaluation of crude drugs; biosynthetic origin of drugs and pharmaceuticals, representative examples, and their value in pharmacy and medicine. Prerequisite: Botany 1; Chemistry 151-52; Zoology 1 or 2. Laboratory fee, \$11.
- 164 Introduction to Pharmacology (3)** Leonard
Spring—morning. Historical development, literature, and general principles of pharmacology; general anatomical, physiological, and pharmacological considerations of the autonomic, central, and somatic nervous systems; cardiovascular, gastrointestinal, and genitourinary systems; skin and mucous membranes. Prerequisite: Physiology 115; Zoology 2. Prerequisite or concurrent registration: Biochemistry 221-22.
- 165-66 Pharmacology (3-4)** Leonard
First half: fall—lecture (3 hours), morning. Second half: spring—lecture (3 hours), morning; laboratory (4 hours), afternoon. Drugs acting on the autonomic, central, and somatic nervous systems; cardiovascular, hematopoietic, genitourinary, endocrine, and digestive systems; histamine and antihistaminics; anti-infective agents; miscellaneous drugs; and their major clinical indications or therapeutic uses. Prerequisite: Microbiology 112; Biochemistry 121-22; Pharmacy 164. Pharmacy 166: laboratory fee, \$18.
For students in the four-year program, Pharmacy 166 is a 3 credit course (lecture—2 hours; laboratory—4 hours). Such students will receive instruction on drugs acting on the skin and mucous membranes; digestive, hematopoietic, and urinary systems; and anti-infective agents in Pharmacy 105-6. Biochemistry 221-22 is taken concurrently with Pharmacy 165-66 in the 4-year curriculum.
- 167-68 Pharmacology III (3-3)** Leonard
First half: spring—as arranged. Second half: not offered 1961-62. Laboratory work in pharmacological technique. Prerequisite: Pharmacy 106. Prerequisite or concurrent registration: Pharmacy 165. Laboratory fee, \$18 a semester.

- 172 *Advanced Dispensing Pharmacy* (3) Kokoski
Spring—morning. The study of special problems in dispensing pharmacy. Prerequisite: Pharmacy 103. Laboratory fee, \$18.
- 174 *Quantitative Pharmaceutical Analysis* (3) Bliven, Schwartz
Spring: lecture (1 hour), laboratory (6 hours)—morning. Drug analysis. Prerequisite: Chemistry 22. Laboratory fee, \$18.
- 176 *Pharmaceutical Law* (3) Frailey
Spring—morning. Students in the four-year program receive 2 semester hours of credit.
- 178 *Pharmacy Management* (4) Koustenis
Spring—morning. Policies and operations relating to the management of pharmacy.
- 182 *Advanced Pharmacology I* (2) Leonard
Not offered 1961-62. Special problems in the field of pharmacology. Prerequisite or concurrent registration: Pharmacy 166.
- 184 *Special Problems in Pharmacy* (arr.) Kokoski, Schwartz
Fall—as arranged; spring—as arranged. Directed laboratory and library research on special problems in pharmacy and pharmaceutical chemistry. For selected undergraduate students. Prerequisite: Pharmacy 102 and 110. Fees to be arranged.
- 188 *Survey* (1) Bliven and Staff
Spring—morning. A symposium covering the various phases of pharmacy.
- 190 *Hospital Pharmacy* (1) Cooper
Spring—afternoon. Organization and functions of hospitals; organization and operation of a hospital pharmacy; professional and sickroom supplies. Prerequisite: Pharmacy 102.
- 192 *Hospital Pharmacy: Prescription Practice* (1) Cooper and Staff
Fall—as arranged; spring—as arranged; summer 1961. Prescription practice in the University Hospital Pharmacy. Prerequisite: Pharmacy 102.
- 194 *Manufacturing Pharmacy* (3) Cooper and Staff
Lecture (1 hour), laboratory (6 hours). Fall—as arranged; spring—as arranged; summer 1961. The manufacture of bulk pharmaceuticals in the University Hospital Pharmacy. Elective for seniors.

THIRD GROUP*

- 201-2 *Survey of Pharmaceutical Literature* (1-1) The Staff
Assigned library research on the development of pharmaceutical literature.
- 203-4 *Special Problems in General Pharmacy* (2-2) Kokoski
Investigations of problems involved in the manufacture of pharmaceutical preparations on a laboratory scale. Laboratory fee, \$18 a semester.
- 206 *Pharmaceutical Technology* (4) Kokoski, Cooper
Lecture (2 hours); laboratory (6 hours). A study of advanced manufacturing pharmacy, including formula development for the different types of preparations. Laboratory fee, \$18.
- 215-16 *Advanced Pharmacology II* (3-3) Leonard
Lecture (1 hour); laboratory (6 hours). Special studies on biological assay methods. Laboratory fee, \$18 a semester.
- 221-22 *Chemistry of Naturally Occurring Organic Medicinal Products* (5-5) Schwartz
Lecture (3 hours); laboratory (6 hours). A study of the methods of isolation, characterization, influence of chemical alteration on biological activity, and chemistry of alkaloids, steroids, terpenes, glycosides, and antibiotics. Laboratory fee, \$18 a semester.

* Courses in this group are not offered in 1961-62.

- 223-24 Chemistry of Synthetic Organic Medicinal Products (5-5)** Schwartz
Lecture (3 hours); laboratory (6 hours). A study of the structure, synthesis, and the correlation between chemical structure and pharmacological activity in the following classes of drugs: autonomic, local anesthetics, antihistaminics, central nervous system depressants, and selected antibacterial compounds. Laboratory fee, \$18 a semester.
- 226 Determination of Physical Constants (2)** Schwartz
Lecture (1 hour); laboratory (3 hours). A laboratory and lecture study of the determination of physical constants of medicinal products. Laboratory fee, \$18.
- 228 Food and Drug Analysis (4)** Schwartz, Bliven
Lecture (2 hours); laboratory (6 hours). A study of the composition of some common foods and food products. Laboratory fee, \$18.
- 231 Pharmacology of Anesthetic Drugs (4)** Leonard
Theoretical consideration of the principles of anesthesiology and laboratory study of the action of anesthetic drugs. Laboratory fee, \$18.
- 234 Pharmacology of Autonomic Drugs (4)** Leonard
A study of action and interaction of drugs principally influencing the autonomic nervous system. Laboratory fee, \$18.
- 236 Experimental Toxicology (4)** Leonard
Pharmacological action of toxic drugs correlated with chemical and pathological studies. Laboratory fee, \$18.
- 251-52 Graduate Seminar (1-1)** The Staff
Current problems and trends in pharmacy. Required of all students registered for the Master's degree.
- 295-96 Research and Thesis (arr.)** The Staff
Investigations of special problems in the major field of interest and thesis preparation. Semester hours (not to exceed 6) and fees to be arranged.

PHILOSOPHY*

Professor C. E. Gauss (*Executive Officer*)
Assistant Professor R. H. Schlagel
Lecturer C. H. Pfuntner

Bachelor of Arts with a major in Philosophy (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51 and 52. Required: in addition to the general requirements for Columbian College stated on pages 61-65, the grade of "pass" for the Philosophy major examination at the end of the senior year. The coordinated knowledge upon which the student will be examined is schematized under the following two general headings: (1) methodology and theory of knowledge and (2) the history of ideas and social philosophy. The Department of Philosophy provides a proseminar (Philosophy 199-200) intended to assist the student in preparing for the major examination.

Master of Arts in the field of Philosophy (Columbian College).—Prerequisite: an undergraduate major in Philosophy at this University or the equivalent, as attested by the passing of this University's major examination in Philosophy; the following specific courses or the equivalent: Philosophy 111-12, 113, 121-22, and 131.

Required: the general requirements of Columbian College as stated on pages 66-69. As much as possible of the required course work must be in third-group courses. Where second-group courses are elected students will be required to do more intensive and extensive work than undergraduates. A general written examination in two areas of Phi-

* The Staff of Instruction here listed is for the academic year 1960-61.

losophy and an oral examination in the student's special field will be required in addition to a Master's thesis of substantial length.

FIRST GROUP

- 51-52 *Introduction to Philosophy* (3-3) The Staff
 Academic year—morning and evening; summer 1961—Philosophy 51 (3). A critical introduction to the problems of modern philosophy in relation to scientific and social developments since the Renaissance. This course is not merely intended as an introduction to those courses in philosophy which follow but is a unit complete in itself for those students in other departments interested in the problems of philosophy relevant to modern thought.

SECOND GROUP

- 101 *Philosophic Problems in Living Issues* (1) Gauss
 Fall—afternoon. Selected public issues used as the basis for demonstrating the methods and relevance of philosophical analysis. This course may be reelected for credit once only.
- 111-12 *History of Philosophy* (3-3) Gauss
 Academic year—morning; summer 1961—Philosophy 111 (3). The history of western philosophy from early Greece to Kant, seen as the development and modification of the Hellenic cultural pattern.
- 113 *History of Nineteenth and Twentieth Century Philosophy* (3) Pfuntner
 Fall—evening. European philosophy from the time of Kant. "Isms" and ideologies at the root of contemporary thought.
- 121-22 *Logic and Scientific Method* (3-3) Pfuntner
 Academic year—evening. *First half*: the elementary principles of valid reasoning with emphasis on developing skill in using these principles, introductory consideration of symbolic logic, the nature of a formal system. *Second half*: general analysis of the methods of investigation and reasoning used in the natural and social sciences, procedures and requirements of definition, classification and sorting, analogical and inductive inference, causal determination, the nature and function of hypothesis, measurement, principles of the theory of probability.
- 131 *Ethics* (3) Schlagel
 Fall—morning. A critical examination of traditional ethical theories from Plato to Ayer. Consideration of the theoretical problems of ethics: the meaning of "good", the nature of ethical judgment, the justification of ethical standards. The course aims at enabling the student to develop his own ethical view as a consequence of his greater understanding of moral phenomena.
- 142 *Philosophies Men Live by* (3) Schlagel
 Spring—morning. Critique of the tenets, methodologies, and presuppositions of current, vital philosophical orientations: Existentialism, Positivism, Pragmatic Naturalism, Theism, Linguistic Analysis. A critique of reason and faith, and the nonrational aspects of man as guiding influences in life.
- 151 *The Philosophy of Science* (3) Schlagel
 Not offered 1961-62. Brief history of modern science; problems of the meaning of causality, the justification of induction, theories of probability; the nature of scientific explanation and the status of inferred entities; the nature of a mathematical system. Consideration of the philosophic import of certain scientific theories such as Einstein's theory of relativity, Heisenberg's principle of indeterminacy, and Bohr's principle of complementarity.
- 152 *Epistemology* (3) Schlagel
 Spring—morning. The meaning and criteria of truth; the meaning and cognitive significance of common sense, scientific, and religious propositions or beliefs. Study of problems related to perception, verification, universals, *a priori* and *a posteriori* knowledge, the concept of mind.

- 162 *Aesthetics* (3) Gauss
Spring—evening. The nature of aesthetic experience, problems of appreciation and judgment in the arts, and of the theories and process of artistic creation. Emphasis on contemporary arts and criticism.
- 172 *American Philosophy* (3) Pfuntner
Spring—evening. The philosophies of Peirce, Royce, James, Dewey, and Santayana as representative of American thought.
- 180 *Philosophy of History* (3) Gauss
Not offered 1961-62. Problems of historical knowledge and explanation. Critique of philosophies of history.
- 193 *Topics in Contemporary Philosophy* (3) Gauss
Fall—evening. Intensive study of one selected topic in contemporary philosophic literature.
- 199-200 *Proseminar: Readings for the Major* (3-3) Schlager
Academic year—to be arranged. Conferences and group discussions in preparation for field-of-study major examination.

THIRD GROUP

- 201-2 *Readings and Research* (3-3) The Staff
Academic year—as arranged. Advanced readings and reports. Investigation of special problems.
- 211 *Seminar in Plato* (3) Gauss
Not offered 1961-62. Intensive study of Plato's later dialogues.
- 212 *Seminar in Aristotle* (3) Schlager
Not offered 1961-62. Aristotle's logic, metaphysics, and philosophy of science.
- 216 *Seminar in Kant* (3) Schlager
Fall—to be arranged. A study of one of Kant's Critiques.
- 262 *Seminar in Aesthetics* (3) Gauss
Spring—to be arranged. Intensive study in selected problems in the philosophy of art.
- 299-300 *Thesis* (3-3) The Staff

RELATED COURSE IN ANOTHER DEPARTMENT

- Mathematics 101, *Introduction to Mathematical Logic* (3)

PHYSICAL EDUCATION FOR MEN*

Professors W. H. Myers, J. H. Krupa (*Executive Officer*)

Associate Professors R. G. Hanken, V. J. DeAngelis

Lecturers Pat Abernethy, W. D. Thompson

Associates W. J. Reinhart, W. T. Elias (to January 1961), J. V. Camp (since January 1961)

This department includes all the recognized athletic activities of the men students of the University.

* The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the departments of Physical Education, and the student assumes full responsibility therefor.

The Staff of Instruction here listed is for the academic year 1960-61.

Two years of Physical Education (Physical Education 1-2 and 11-12) are required of all men for graduation, except those students exempt under the regulations stated on page 43.

Upon entering the University, all freshmen or other undergraduate students who have not fulfilled the Physical Education requirements are given a medical examination. Assignments for medical examinations will be given at the time of registration. The students who satisfy the requirements of the medical examination are then given a physical efficiency test in the general bodily skills of agility, endurance, and strength; and in swimming. If the physical efficiency test is passed, the student may elect from the following list of activities:

Setting-up Exercises (stretching exercises)

Body Building Exercises (gymnastic apparatus and weight training skills)

Competitive games and sports

Swimming (beginner, intermediate, advanced, life saving)

If the physical efficiency test is not passed, the student will be assigned to a class for training in the above activities in the order listed.

The Department furnishes gymnasium uniforms and personal equipment upon receipt of a small payment.

Bachelor of Science in Physical Education (School of Education).—Prerequisite: the Physical Education for Men curriculum in the Junior College, see page 54. The requirements for the degree are stated on pages 123-24 and 125-26.

Bachelor of Arts in Education with (1) a major in secondary education combined with a teaching field in Physical Education and (2) a major in elementary education with an area of specialization in Physical Education, see the School of Education Catalogue.

FIRST GROUP

1-2 Freshman Physical Education (1-1)

Academic year—as arranged. Two periods of supervised activity a week. Locker and towel fee,* \$4.50 a semester. The Staff

11-12 Sophomore Physical Education (1-1)

Academic year—as arranged. Two periods of supervised activity a week. Locker and towel fee,* \$4.50 a semester. The Staff

41 Personal Health (1)

Spring—morning. Physical, mental, and social health of the individual—understanding, significance, and promotion. Emphasis on personal health knowledges for the future teacher. Krupa

43-44 Techniques of Physical Education Motor Activities (2-2)

Academic year—morning. Fundamental skills, rules, and organization. Locker and towel fee,* \$4.50 a semester. DeAngelis, Krupa

45-46 Teaching Individual and Dual Sports in Secondary Schools (2-2)

Academic year—afternoon. Tennis, golf, swimming, wrestling, badminton, bowling. Locker and towel fee,* \$4.50 a semester. Hanken, Krupa

47 Introduction to Physical Education (2)

Fall—morning. An orientation course presenting the problems of physical education, vocational analysis, scientific foundations, and scope of field. Myers

48 Introduction to Recreation (2)

Spring—as arranged. The role of recreation in modern living; current practices in community recreation work; standards of training, experience, and salary; types of leadership. Hanken

49 Human Anatomy (3)

Fall—morning. The structure of the human body. Basic course for physical education majors. Also open to both men and women not majoring in Physical Education. Stallings

* The locker and towel fee is required for registration in one or more of the activity courses.

- 50 *Kinesiology* (3) Lawrence
 Spring—morning. A study of the anatomical mechanism of movement, analysis of the action of muscles in physical education activities. Prerequisite: an approved course in anatomy.

- 58 *First Aid and Care of Athletic Injuries* (2) DeAngelis
 Spring—morning. Prevention and emergency care of injuries of all types, with special reference to first aid, civil defense, bandaging, and massage. Prerequisite: Biology 1-2 or Zoology 1-2.

SECOND GROUP

- 101 *Physical Education in the Elementary School* (3) Burtner, Snodgrass
 Fall—afternoon; spring—evening. Physical growth and development of the child and adolescent. Survey of age characteristics and organization of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, and self-testing activities.

- 103 *History and Principles of Physical Education* (3) Myers, Stallings
 Fall—morning. Survey of history as it relates to contemporary physical education. Study of aims, objectives, and philosophy of physical education.

- 105-6 *Adapted Physical Education and Physical Examinations* (3-3) Lawrence

Academic year—morning. Cause and correction of faulty body mechanics, physical examination methods for the diagnosis of postural defects, prescription of exercises, and program adaptation. Prerequisite: Physical Education 49 and 50.

- 107 *Teaching Recreational Dance* (1 to 2) Burtner
 Fall—morning. Methods and materials for teaching the country and social dances of America and the folk dances of other countries to secondary-school age and adult groups. Square-dance calling is included. Locker and towel fee,* \$4.50.

- 109-10 *Leadership Organization in the Intramural Program* (2-2) DeAngelis
 Academic year—afternoon. Principles of administration, organization, and supervision of intramural activities in the physical education program of the junior high school, senior high school, and college.

- 113-14 *Practice in Teaching Physical Education Activities* (2 to 4-2 to 4) Hanken and Staff

Academic year—afternoon. Principles and methods applied to learning and teaching physical education activities. Supervised laboratory. Locker and towel fee,* \$4.50 a semester.

- 115-16 *Teaching Team Sports in Secondary Schools* (2 to 4-2 to 4) DeAngelis, Hanken

Academic year—morning. Football, basketball, baseball, track and field. Locker and towel fee,* \$4.50 a semester.

- 117 *Teaching Modern Dance* (1 to 2) Burtner
 1962-63 and alternate years: fall—afternoon. Techniques for the teaching of movement as a medium of expression. Practical work in body technique, composition, and the analysis of accompaniment for dance including instrumental, voice, and percussion. Application is made to both secondary school and adult age levels. Locker and towel fee,* \$4.50.

- 118 *Dance Production* (1 to 2) Burtner
 1962-63 and alternate years: spring—afternoon. Planning and staging of performances for demonstrations, dance concerts, and folk festivals. Lighting, costuming, sets, and make-up. Choreography for concerts, musicals, and plays for students taking course for two credits. Locker and towel fee,* \$4.50.

* The locker and towel fee is required for registration in one or more of the activity courses.

- 121 *School and Community Health Programs* (3) Krupa
Fall—afternoon. Health services, healthful environment, health instruction, sources of material for general health knowledge. Prerequisite: Biology 1-2 or Zoology 1-2.
- 122 *Methods and Materials for Health Education* (3) Stallings
Spring—evening. Methods and materials for teaching health at each age level. Prerequisite: Biology 1-2 or Zoology 1-2.
- 131 *Tests and Measurements in Physical Education* (3) Krupa
Fall—morning. Critical survey of tests in physical activities, methods of test construction, elementary statistics.
- 132 *Camp Leadership* (1 to 2) Stallings
Spring—afternoon. Philosophy and techniques of camp counseling; survey of organization and programs including outdoor education. Also open to both men and women not majoring in Physical Education.
- 136 *Survey of Dance History and Dance Forms* (3) Burtner
1961-62 and alternate years: spring—as arranged. The development of dance from primitive ritual to present day recreational and art forms of the dance. Includes ethnologic dance, practice and discussion of fundamental movement techniques, and composition.
- 138 *Organization and Administration of Physical Education* (3) Krupa
Spring—as arranged. Organization and administration of physical education programs in elementary and secondary schools and in colleges. Study of plants, fields, equipment, and programs.
- 151-52 *Recreational Leadership Activities* (1 to 3-1 to 3) Abernethy
1961-62 and alternate years: academic year—evening. Fall semester: basic skills for the preschool and school-age child. Laboratory practice in crafts, music, dramatics, physical and social activities. Spring semester: basic skills for the teen-age and adult. Arts and crafts, dramatics, physical and social activities.
- 161 *Community Organization for Recreation* (3) Thompson
1962-63 and alternate years: fall—evening. Resources, principles, and methods in organizing community recreation services.
- 162 *Administration of Community Recreation Programs* (3) Thompson
1962-63 and alternate years: spring—evening. Factors and problems in administering recreation including surveys, legislation, program, area, facilities, leadership, finance, and public relations.

PHYSICAL EDUCATION FOR WOMEN*

Professors Ruth Atwell (*Emeritus*), Helen Lawrence, Elizabeth Burtner
Associate Professor Loretta Stallings (*Executive Officer*)
Assistant Professors Lyndale George, Jeanne Snodgrass
Lecturers Pat Abernethy, W. D. Thompson
Instructors Connie Vaughan, Joyce Fuller
Associate Mabel McEwan

Two years of Physical Education (Physical Education 1-2 and 11-12) are required of all women for graduation, except students exempt under regulations stated on page 43. In the fall a medical and physical examination is given each student for the purpose of

* The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the departments of Physical Education, and the student assumes full responsibility therefor.

The Staff of Instruction here listed is for the academic year 1960-61.

discovering individual needs. Those students whose examinations indicate the desirability of remedial or restricted activity are assigned to a program especially adapted to their needs. This limited program includes moderate sports and individual exercises in small groups under careful supervision.

The required costume for Physical Education classes may be purchased at the University Book Store.

Bachelor of Science in Physical Education (School of Education).—Prerequisite: the Physical Education for Women curriculum in the Junior College, see pages 54-55. The requirements for the degree are stated on pages 123-24 and 126-27.

Within the curriculum leading to the degree of Bachelor of Science in Physical Education there is opportunity for specializing in dance, correctives, or recreation.

Bachelor of Arts in Education with (1) a major in secondary education combined with a minor teaching field in Physical Education and (2) a major in elementary education with an area of specialization in Physical Education, see the School of Education Catalogue.

FIRST GROUP

1-2 Freshman Physical Education (1-1)

The Staff

Academic year: fundamentals of health and physical education—morning and afternoon; activity—morning and afternoon. One period of fundamentals of health and physical education and two periods a week chosen from the activities offered each season.

Fundamentals of health and physical education: one semester on study of the factors involved in the general maintenance of health, efficient use of the body, and fundamentals of movement; one semester on fundamentals of dance.

Activities: badminton, basketball, body mechanics, canoeing, field hockey, recreational dance, golf, fencing, modern dance, riding, skating, swimming, synchronized swimming, tennis, bowling, volleyball, softball, lifesaving. Locker and towel fee,* \$4.50 a semester.

11-12 Sophomore Physical Education (1-1)

The Staff

Academic year: two periods a week—morning and afternoon. Two periods a week chosen from the activities offered each season as listed under Physical Education 1-2. Locker and towel fee,† \$4.50 a semester.

43-44 Techniques of Physical Education Motor Activities (2-2)

The Staff

Academic year—as arranged. Fundamental skills, rules, and organization. Locker and towel fee,* \$4.50 a semester.

49 Human Anatomy (3)

Stallings

Fall—morning. The structure of the human body. Basic course for physical education majors. Also open to both men and women not majoring in Physical Education. Prerequisite: Biology 1-2 or Zoology 1-2.

50 Kinesiology (3)

Lawrence

Spring—morning. A study of the anatomical mechanism of movement, analysis of the action of muscles in physical education activities. Prerequisite: an approved course in anatomy.

51-52 Teaching Physical Education Activities (2-2)

The Staff

1961-62 and alternate years: academic year—afternoon. Team sports: basketball, hockey, softball, soccer, speedball. Individual and dual sports: tennis, badminton, archery, swimming and diving, lifesaving and water safety. Gymnastics. Tumbling. Locker and towel fee,* \$4.50 a semester.

58 First Aid and Care of Athletic Injuries (2)

DeAngelis

Spring—morning. Prevention and emergency care of injuries of all types, with special reference to first aid, civil defense, bandaging, and massage. Prerequisite: Biology 1-2 or Zoology 1-2.

* The locker and towel fee is required for registration in one or more of the activity courses.

SECOND GROUP

- 101 *Physical Education in the Elementary School* (3) Burtner, Snodgrass
Fall—afternoon; spring—evening. Physical growth and development of the child and adolescent. Survey of age characteristics and organization of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, self-testing activities, and body mechanics.
- 103 *History and Principles of Physical Education* (3) Stallings, Myers
Fall—morning. Survey of history as it relates to contemporary physical education. Study of aims, objectives, and philosophy of physical education.
- 105-6 *Adapted Physical Education and Physical Examinations* Lawrence
(3-3)
Academic year—morning. Cause and correction of faulty body mechanics, physical examination methods for the diagnosis of postural defects, prescription of exercises, and program adaptation. Prerequisite: Physical Education 49 and 50.
- 107 *Teaching Recreational Dance* (1 to 2) Burtner
Fall—morning. Methods and materials for teaching the country and social dances of America and the folk dances of other countries to secondary school age and adult groups. Square-dance calling is included. Locker and towel fee,* \$4.50.
- 111-12 *Teaching Physical Education Activities* (2-2) The Staff
1962-63 and alternate years: academic year—afternoon. Continuation of methods and materials in activities listed under Physical Education 51-52. Locker and towel fee,* \$4.50 a semester.
- 113-14 *Practice in Teaching Physical Education Activities* The Staff
(2 to 4-2 to 4)
Academic year—as arranged. Principles and methods applied to learning and teaching physical education activities. Supervised laboratory. Locker and towel fee,* \$4.50 a semester.
- 117 *Teaching Modern Dance* (1 to 2) Burtner
1962-63 and alternate years: fall—afternoon. Techniques for the teaching of movement as a medium of expression. Practical work in body technique, composition, and the analysis of accompaniment for dance including instrumental, voice, and percussion. Application is made to both secondary school and adult age levels. Locker and towel fee,* \$4.50.
- 118 *Dance Production* (1 to 2) Burtner
1962-63 and alternate years: spring—afternoon. Planning and staging of performances for demonstrations, dance concerts, and folk festivals. Lighting, costuming, sets, and make-up. Choreography for concerts, musicals, and plays for students taking course for two credits. Locker and towel fee,* \$4.50.
- 121 *School and Community Health Programs* (3) Krupa
Fall—afternoon. Health services, healthful environment, health instruction, sources of material for general health knowledge. Prerequisite: Biology 1-2 or Zoology 1-2.
- 122 *Methods and Materials for Health Education* (3) Stallings
Spring—evening. Methods and materials for teaching health at each age level. Prerequisite: Biology 1-2 or Zoology 1-2.
- 131 *Tests and Measurements in Physical Education* (3) Krupa
Fall—morning. Critical survey of tests in physical activities, methods of test construction, elementary statistics.
- 132 *Camp Leadership* (1 to 2) Stallings
Spring—afternoon. Philosophy and techniques of camp counseling; survey of organization and programs including outdoor education. Also open to both men and women not majoring in Physical Education.

* The locker and towel fee is required for registration in one or more of the activity courses.

- 136 *Survey of Dance History and Dance Forms* (3) Burtner
1961-62 and alternate years: spring—as arranged. The development of dance from primitive ritual to present day recreational and art forms of the dance. Includes ethnologic dance, practice and discussion of fundamental movement techniques, and composition.
- 138 *Organization and Administration of Physical Education* (3) Stallings
Spring—as arranged. Organization and administration of physical education programs in elementary and secondary schools and in colleges. Study of plants, fields, equipment, and programs.
- 151-52 *Recreational Leadership Activities* (3-3) Abernethy
1961-62 and alternate years: academic year—evening. Fall semester: basic skills for the preschool and school-age child. Laboratory practice in crafts, music, dramatics, physical and social activities. Spring semester: basic skills for the teen-age and adult. Arts and crafts, dramatics, physical and social activities.
- 161 *Community Organization for Recreation* (3) Thompson
1962-63 and alternate years: fall—evening. Resources, principles, and methods in organizing community recreation services.
- 162 *Administration of Community Recreation Programs* (3) Thompson
1962-63 and alternate years: spring—evening. Factors and problems in administering recreation including surveys, legislation, program, area, facilities, leadership, finance, and public relations.

PHYSICAL MEDICINE AND REHABILITATION*

Professor C. S. Wise (*Executive Officer*)
Assistant Professor John Watt, Jr.
Associates A. B. C. Knudson, F. L. Wenger

- 150 *Elements of Physical Medicine* The Staff
Spring—as arranged. In arrangement with the Anatomy Department, lectures and demonstrations of the various tests and measurements are employed in the evaluation of physical disability.
- 352 *Advanced Physical Medicine* The Staff
Spring—1 hour a week. Lectures and demonstrations concerning the various techniques, clinical applications of physical medicine and rehabilitation to be integrated with the teaching of the associated medical and surgical specialties.
- 467-68 *Clinical Studies (elective)* The Staff
Academic year—as arranged. Clinical teaching and demonstration at the University Hospital.
- 485 *Research* (arr.) The Staff
Fall—as arranged. Open to medical students and qualified nonmedical students.

* The Staff of Instruction here listed is for the academic year 1960-61.

PHYSICS*

Professors G. M. Koehl (*Acting Executive Officer*), Lewis Slack, Herbert Jehle
Associate Professor H. H. Hobbs
Associate Professorial Lecturer H. H. Landon, Jr.
Assistant Professors S. S. Yeandle, Jr., Margaret Montzka
Lecturers A. P. Kenyon, J. N. Tevis, DeWitt Fisher, J. M. Harrison, K. F. Oerlein,
 Herbert Rabin, W. J. Condell, Jr., J. E. Tompkins
Instructor Pratip Raychowdhury

Bachelor of Arts or Bachelor of Science with a major in Physics (Columbia College—Departmental).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, see pages 51–52. The following courses must be included: Physics 11, 12, 13, 16 and 55; or 11, 14, 15, 16; Chemistry 21; Mathematics 29, 30, and 31.

Students who started work toward a major in Physics prior to the reorganization of the introductory courses in Physics and Mathematics, which went into effect in the fall of 1959–60, may substitute Physics 5, 6, and 7 for Physics 11, 12, and 13; and Mathematics 19 and 20 for Mathematics 29, 30, and 31.

Required, for both the Bachelor of Arts degree and the Bachelor of Science degree: the general requirements of Columbia College as stated on pages 61–65, including Mathematics 112 and Physics 101, 105, 106, 113, 102 or 114, and 153, 155, or 156, plus one of the following: Physics 118, 123, and 132.

Master of Arts or Master of Science in the field of Physics (Columbia College).—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Physics at this University, or the equivalent. Required: the general requirements as stated on pages 66–69. The thirty hours of required work must include Mathematics 171 (if not taken earlier) and Physics 201, 202, 219, 255 or 256, and 291–92.

Doctor of Philosophy (Graduate Council).—See page 74.

Bachelor of Science in Engineering with an option in Physics (School of Engineering).—For requirements, see pages 100–102 and 104–5.

Bachelor of Arts in Education with a teaching field in Physics (School of Education).—Prerequisite: the Education curriculum, pages 53–54.

Required: the physics option and the professional courses listed in the School of Education Catalogue.

FIRST GROUP

- 11 *Introductory Physics* (3) Koehl and Staff
 Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Fall—morning, afternoon, and evening. Spring: lecture—morning and evening; recitation—morning, afternoon, and evening; laboratory—morning, afternoon, and evening. Summer 1961.
 An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. This course may be taken as a terminal course by nonscience students who wish an introduction to the physical sciences. Prerequisite: high school algebra and plane geometry. Material fee, \$11.
- 12 *Introductory Physics* (3) Koehl and Staff
 Spring: lecture (1 hour), recitation (1 hour), laboratory (2½ hours)—morning, afternoon, and evening; summer 1961. Mechanics, wave-motion, and sound. Prerequisite: Physics 11 (or former Physics 5). Material fee, \$11.
- 13 *Introductory Physics* (3) The Staff
 Fall: lecture (1 hour), recitation (1 hour), laboratory (2½ hours)—morning, afternoon, and evening. Elementary electricity and magnetism. Prerequisite: Physics 11 (or former Physics 5). Material fee, \$11.
- 14 *General Physics* (3) Slack and Staff
 Spring: lecture (1 hour), recitation (1 hour), laboratory and conference (2½ hours)—morning, afternoon, and evening; summer 1961. Mechanics, wave-motion, and

* The Staff of Instruction here listed is for the academic year 1960–61.

sound. Prerequisite: Physics 11. Prerequisite or concurrent registration: Mathematics 29. Material fee, \$11.

15 General Physics (3)

The Staff

Fall: lecture (1 hour), recitation (1 hour), laboratory and conference (2½ hours)—morning, afternoon, and evening. Electricity and magnetism. Prerequisite: Physics 14. Prerequisite or concurrent registration: Mathematics 30. Material fee, \$11.

16 General Physics (3)

Hobbs

Spring: lecture (2 hours), conference (1 hour)—morning and evening. Modern physics, molecular structure of matter, structure of the atom. Prerequisite: Physics 13 or 15, Mathematics 30, and consent of the instructor.

55 Physical Measurements (3)

Slack and Staff

Fall: lecture (2 hours), laboratory (3 hours)—afternoon and evening. Theory and methods of precise measurements in the several fields of physics. Prerequisite: Physics 11 and 12, Mathematics 29. Material fee, \$11.

SECOND GROUP

101 Mechanics (3)

Jehle

1961-62 and alternate years: fall—morning; 1962-63 and alternate years: fall—evening. Statics, elasticity, dynamics of solids and fluids, and gravitation. Prerequisite: Physics 12 (or former Physics 6) or 14, Mathematics 31 or 20.

102 Heat and Thermodynamics (3)

Yeandle

Fall—evening. Fundamental concepts, heat transfer, the laws of thermodynamics with applications to physical systems. Prerequisite: Physics 16 or 8, Mathematics 31 or 20.

105 Principles of Electricity (3)

Slack

1961-62 and alternate years: fall—evening; 1962-63 and alternate years: fall—morning. Elementary d-c and a-c circuit theory, electric and magnetic fields, dielectric and magnetic materials, motion of charged particles in electric and magnetic fields. Prerequisite: Physics 16 or former 8, Mathematics 31 or 20.

106 Optics (3)

Koehl

1961-62 and alternate years: spring—evening; 1962-63 and alternate years: spring—morning. Geometrical optics; elementary theory of wave motions; interference, diffraction, polarization, and dispersion of light; laws of black-body radiation. Prerequisite: Physics 16 or former 8, Mathematics 31 or 20.

113 Atomic Physics (3)

Hobbs

1961-62 and alternate years: fall—evening; 1962-63 and alternate years: fall—morning. Properties of elementary particles, interactions with radiation, atomic structure, optical and X-ray spectra, introduction to wave mechanics. Prerequisite: Physics 16 or former 8, 101 or 105, or the equivalent, Mathematics 31 or 20.

114 Statistical Physics (3)

Jehle

1961-62 and alternate years: spring—evening. Classical and quantum statistics with emphasis on Maxwell-Boltzmann statistics; applications to kinetic theory of gases, gaseous diffusion, specific heats of gases and solids. Prerequisite: Physics 16 or former 8, Mathematics 31 or 20, permission of the instructor.

116 Quantum and Solid State Physics (3)

Hobbs

Fall—afternoon and evening. Primarily for engineers. Prerequisite: Physics 16, Mathematics 111.

118 Introduction to Solid State Physics (3)

Hobbs

1961-62 and alternate years: spring—morning; 1962-63 and alternate years: spring—evening. Dielectric and magnetic properties of solids, electron theory of metals, semiconductors, dislocations, and plastic flow. Prerequisite: Physics 113.

123 Nuclear Physics (3)

Slack

1961-62 and alternate years: spring—morning; 1962-63 and alternate years: spring—evening. Structure and stability of atomic nuclei, nuclear transformations and reactions, radiations of nuclei, fission. Prerequisite: Physics 113.

128 Sound (3)

1962-63 and alternate years. Production, propagation, and detection of sound waves; vibrations of sounding bodies; acoustic instruments and acoustic measurements. Prerequisite: Physics 16 or former 8, Mathematics 31 or 20.

132 Electronics (3)

Lecture (2 hours), laboratory (3 hours). 1961-62 and alternate years: spring—evening; 1962-63 and alternate years: spring—morning. The phenomena of electron emission from solids, the physical properties of electron tubes, and the principles underlying their basic applications. Prerequisite: Physics 16 or former 8 and 55, and a course in d-c and a-c circuits in Physics or Engineering. Material fee, \$11.

153 Advanced Laboratory in Atomic Physics (3)

Spring: Saturday—as arranged. Prerequisite: Physics 16 or former 8, 55. Material fee, \$11. Slack

155 Advanced Laboratory in Electricity and Magnetism (3)

1962-63 and alternate years. Prerequisite: Physics 55, 105. Material fee, \$11.

156 Advanced Laboratory in Optics (3)

1962-63 and alternate years. Prerequisite: Physics 55, 106. Material fee, \$11. Hobbs

181 Biophysics (3)

Spring—evening. Molecular basis of biophysics, biosynthesis, and reproduction. Molecular and genetic aspects of the effects of radiation. Physicochemical equilibria, steady states, and transients in biological systems; order, disorder, and information theory. Admission by permission of the instructor. Jehle, Yeandle

191 Nuclear Reactors (3)

Fall—evening. Neutron physics: sources of neutrons, neutron reactions, slowing down and diffusion; introduction to transport theory; fission process; reactor types; basic theory of homogeneous and heterogeneous reactors, including specific numerical studies from recent publications. Prerequisite: Physics 16 or 8; Mathematics 31 or 20.

THIRD GROUP

201 Classical Physical Theory (3)

Fall—evening. Classical nonrelativistic and relativistic field theories. Prerequisite: Physics 101 and 105; Mathematics 132, 171. (Mathematics 171 may be taken concurrently.) Jehle

202 Classical Physical Theory (3)

Spring—evening. Dynamics of systems of particles and of rigid bodies, generalized coordinates. Prerequisite: Physics 101; Mathematics 112 or 132, 171. Jehle

218 Solid State Physics (3)

Spring—evening. Tensor properties of crystals. Application of wave mechanics to problems in solid state physics. Hobbs

219-20 Wave Mechanics (3-3)

Academic year—evening. Criticism of classical ideas of mechanics and a formulation of wave-mechanical equations; matrix mechanics and its relation to wave mechanics; application to various problems of atomic, molecular, and nuclear physics. Prerequisite: Physics 113, 201, 202. Jehle

222 Quantum Electrodynamics and Field Theories (3)

Not offered 1961-62. Relativistic wave equation, quantization of electromagnetic fields, interaction between matter and radiation, elementary particles and their transformations. Prerequisite: Physics 219-20.

227 Irreversible Processes (3)

Spring—evening. Extension of thermodynamic concepts to irreversible processes. Discussion of thermodynamic forces and fluxes, and the Onsager reciprocal relations. Review of the statistical mechanical reasons for assuming the postulate of irreversible thermodynamics. Prerequisite: Physics 102, 114; Mathematics 132. Yeandle

255-56 Graduate Laboratory (4-4)

First half: fall—morning. Second half: not offered 1961-62. Individual work on special topics. One semester of this course is required of all Master's candidates in physics. Students electing this course may begin with Physics 255 or 256. Not open to undergraduates. Material fee, \$11 a semester.

The Staff

291-92 Seminar: Recent Developments in Physics (1-1)

Academic year: alternate weeks—Monday evening. Individual investigations of special problems. All students registered for a Master's degree in physics are expected to attend this seminar during residence for the degree, and to take part in its programs. Credit for participation in the seminar work is obtained by registering for this course during the last two semesters of residence; this credit, however, is based upon the seminar work during the entire period of residence.

The Staff

299-300 Thesis (3-3)

Academic year—as arranged. Fees to be arranged.

The Staff

PHYSIOLOGY*

Professors C. E. Leese, C. A. M. Hogben (Executive Officer)

Associate Professors E. M. Renkin,† F. P. J. Diecke

Assistant Professors Ruth McClintock, C. S. Tidball (Research), L. P. Sullivan

Lecturers Eugene Braunwald, J. F. Hoffman, D. P. Rall

Associates Saul Winegrad, P. G. Linaweaver, Jr., R. J. Gumnit, Margaret Westecker, Elizabeth Tidball, K. A. Hubel, K. W. Kohn, W. C. Mohler, P. G. Nelson, J. H. Mitchell

Special Lecturer S. J. Sarnoff

Master of Arts or Master of Science in the field of Physiology (Columbia College).—Undergraduate work should include chemistry and physics. It should be supplemented by further courses in mathematics and science such as calculus, physical and organic chemistry.

Required: the general requirements of Columbia College as stated on pages 66-69. In addition to the thesis, the thirty hours of required work should include Physiology 221 or 222, 231, and at least three credit hours of research (Physiology 295 or 296).

Doctor of Philosophy (Graduate Council).—See page 75.

115 Physiology (3)

Fall: section A—Tues. and Thurs., 8:45 to 10:00 A.M.; section B—Tues. and Thurs., 5:10 to 6:25 P.M. Lectures for nonmedical students covering the fundamentals of physiology in its various subdivisions. Prerequisite: one year of general science or one semester of a biological science. Prerequisites and time subject to change 1961-62.

Leese

117 Experimental Physiology (1)

Fall—Fri., 2:10 to 5:10 P.M. Laboratory exercises in the fundamentals of physiology for nonmedical students. Prerequisite or concurrent registration: Physiology 115; or the equivalent. Material fee, \$18. Prerequisites and time subject to change 1961-62.

The Staff

120 Physiology of Endocrine Activity (2)

Not offered 1961-62. For nonmedical students. The circulatory, metabolic, reproductive growth, and other adaptations immediate and long term; accompanying and affecting endocrine activity. Prerequisite: Physiology 115 or the equivalent.

* The Staff of Instruction here listed is for the academic year 1960-61.
† On leave of absence 1960-61.

- 130 *The Psycho-physiology of Personality* (2) Leese
 Spring—Tues. and Thurs., 5:10 P.M. For nonmedical students. Lectures on the genesis and expression of personality, with emphasis on the physiological approach. Prerequisite: Physiology 115 or the equivalent and general psychology.
- 149-50 *Medical Physiology* Hogben and Staff
 Fall—4 hours a week; spring—14 hours a week. Lectures and laboratory work in all divisions of Physiology. This course is designed for medical students.
- 211-12 *Problems in Physiology* (arr.) Hogben
 Academic year—as arranged. For nonmedical graduate students. Open to undergraduate students with the approval of the Department. Prerequisite: Physiology 115 and 117, or the equivalent.
- 221-22 *Physiology Seminar* (1-1) The Staff
 Academic year—1 hour a week, as arranged. For nonmedical students undertaking graduate work in physiology. Prerequisite: Physiology 115 and 117, or the equivalent.
- 231-32 *Advanced Physiology* (6-6) Renkin
 A year course: credit is not given for the first half until the second half is completed. Fall—4 hours a week; spring 14 hours a week, as arranged.
- 249-50 *Introduction to Medical Research** (3-3) The Staff
 Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.
- 269-70 *Pharmacologic Physiology* (1-1) The Staff
 Academic year—one hour a week, as arranged. Recent advances in physiology and pharmacology for those interested in research. Open to qualified medical and nonmedical students.
- 279 *Topics in Physiology* (1) The Staff
 Fall—one hour a week, as arranged. Review of the active areas of research. Open to qualified medical and graduate students. Prerequisite: Physiology 150 or 232.
- 295-96 *Research* (arr.) The Staff
 Academic year—as arranged.
- 299-300 *Thesis* (3-3) The Staff

POLITICAL SCIENCE†

Professors W. R. West, J. W. Brewer (*Executive Officer*), W. H. Kraus
 Professorial Lecturers F. M. Riddick, W. H. Wriggins
 Associate Professors H. L. LeBlanc, Benjamin Nimer
 Associate Professorial Lecturers R. A. Kinney, William Spencer, R. C. Bain, H. M. Bain
 Assistant Professor H. R. Ludden
 Lecturers C. H. Slayman, T. W. Stanley

Bachelor of Arts with a major in Political Science (Columbian College—Departmental).
 —Prerequisite: the Arts and Letters curriculum in the Junior College as stated on pages 51-52, including Political Science 9-10.

* This is an interdepartmental course. The student should register in the department directing his research.

† The Staff of Instruction here listed is for the academic year 1960-61.

Required: in addition to the general requirements of Columbian College stated on pages 61-65, thirty semester hours from the following groups distributed as follows: twelve hours from Group A; six hours from group B; six hours from Group C; and six additional hours from any group or groups. The student will normally complete all six hours of any full-year course which he selects.

Group A: Political Science 111, 112, 117-18, 121-22. Group B: Political Science 171, 172, 181-82. Group C: Political Science 104, 125, 145, 146, 151-52. Group D: 105, 107, 113, 120, 141, 157-58, 177-78, 187-88, 191-92, 194.

Undergraduate students interested in preparing for graduate work in Public Administration will consult the Executive Officer of the Department of Political Science for modifications of the above requirements.

Bachelor of Arts with a major in Latin American Civilization (Columbian College—Field-of-Study).—See the Department of History, pages 234-35.

Master of Arts in the field of Political Science (Columbian College).—Prerequisite: a Bachelor of Arts degree with a major in Political Science at this University (or the equivalent major elsewhere) with a B average (or better) in the major.

Required: the general requirements of Columbian College as stated on pages 66-69. The thirty hours of required work must be approved in advance by the Adviser.

Master of Arts in the field of Latin American Civilization (Columbian College).—See the Department of History, page 235.

Doctor of Philosophy (Graduate Council).—See page 73.

Bachelor of Arts and Master of Arts in Government in the fields of International Affairs and Public Affairs (School of Government, Business, and International Affairs).—See pages 135-36, 140-41.

FIRST GROUP

1 *Introduction to Government** (3)

Ludden

Fall—morning; spring—evening. Basic principles and problems of political life: theories, forms, and processes of government in the United States and foreign countries. Attention is also given to international relations.

9-10 *Government of the United States** (3-3)

The Staff

First half: fall—morning and evening; spring—morning; summer 1961. *Second half:* fall—morning; spring—morning and evening; summer 1961. *First half:* structure, powers, and operation of the Federal Government; Congress, the President, and the Supreme Court; elections, political parties, and pressure groups. *Second half:* state and local governments; civil rights; major functions of government at federal, state, and local levels.

SECOND GROUP*

104 *State and Local Governments* (3)

LeBlanc

1961-62 and alternate years: spring—morning; summer 1961. State, municipal, and other local governmental forms, operations, and problems, with attention to policy formulation and administration, and to the forces of practical politics.

105 *The Governmental Process of the District of Columbia* (3)

LeBlanc

Not offered 1961-62. Legal structure and political problems of the District of Columbia including restrictions on home rule, Congressional relations, and group politics.

107 *Problems in Modern Political Thought* (3)

Kraus

Summer 1961. Development of democratic political institutions and analysis of the main challenges to constitutional democracy in the 19th and 20th centuries.

111 *Introduction to Comparative Government* (3)

Kraus

Fall—evening; summer 1961. Government and politics of the principal constitutional democracies of Western Europe: Great Britain and France.

112 *Introduction to Comparative Government* (3)

Kraus

Spring—evening. Government and politics of the principal political systems of Central and Eastern Europe: Germany and the Soviet Union.

* Six hours of first-group Political Science courses are prerequisite to all second-group courses.

- 113 *Political Problems of the British Commonwealth of Nations* (3) Kraus
Not offered 1961-62. From Colonial Empire to modern Commonwealth: questions of equal partnership; governments and policies in the principal Commonwealth states; problems of new states.
- 117-18 *Political Theory: the Growth of Political Thought in the West* (3-3) Kraus
Academic year—morning. First half: from Classical Antiquity to the Middle Ages; the forging of the western political tradition. Second half: from the Renaissance and Reformation to recent times. Theoretical foundations of the modern state: morals and politics, sovereignty, absolutism, and resistance; liberalism, democracy, and conservatism.
- 120 *Foundations of American Democracy* (3) Brewer
1962-63 and alternate years. Introduction to political thought in the United States from colonial times to the end of the Civil War period.
- 121-22 *The Constitution of the United States* (3-3) West
Academic year—morning; summer 1961—Political Science 121 (3). Judicial power of federal courts in constitutional interpretation. First half: emphasis on separation of powers, federal-state relationships, and taxation. Second half: emphasis on constitutional protection of civil rights.
- 125 *Legislative Organization* (3) Riddick
1961-62 and alternate years: fall—evening. A study of Congress: constitutional aspects, legal analysis of make-up, and political organization. Political and parliamentary procedures used in the preparation and enactment of legislation. Not open to students who have credit for former Political Science 124.
- 141 *The Development of Legal Institutions* (3) Brewer
1961-62 and alternate years: fall—morning. Introduction to historical jurisprudence: primary attention to the origins of the Roman Law of Continental Europe and of the Anglo-Saxon Common Law.
- 145 *Political Parties and Politics* (3) LeBlanc
Fall—morning. Organization and operations of political parties in the United States: major and minor parties, bosses and corruption, nominations and elections, influence on President and Congress.
- 146 *Political Pressures and Public Reactions* (3) Ludden
Spring—morning. Public opinion, special interest lobbies, and pressure groups as they operate on government to influence public policy.
- 151-52 *Public Administration* (3-3) LeBlanc
Academic year—evening. Introductory survey of the theory and practice of governmental administration and its relation to politics, legislation, the courts, and non governmental organizations and interests.
- 157-58 *Current Problems in Domestic Politics* (1-1) Slayman
Academic year—evening. Analysis of outstanding contemporary issues in internal American politics with discussion of problems and policies.
- 166 *Field Work in Government* (3) LeBlanc
Fall—as arranged; spring—as arranged. Practical training in the operation of the Federal Government, based on experience through assignment to selected government offices. Students will have an opportunity to observe and participate in government in the Washington area. Open only to students in the Public Affairs curriculum, School of Government, Business, and International Affairs.
- 171 *International Politics* (3) Ludden, Nimer
Fall—morning and evening; summer 1961. Basic forces underlying the conduct of international relations and the formation of foreign policy; power politics, imperialism, collective security, and international cooperation.

- 172 *International Organization: the United Nations* (3) Ludden
Spring—morning and evening; summer 1961. Development and current operation of international organization within the system of sovereign states with emphasis on the United Nations.
- 177 *Recent Trends in Latin American Politics and Government* (3) Davis
Fall—evening. Types of government, recent developments, and current political conditions in each of the twenty Latin American republics. May not be taken by students who have credit for former Political Science 176.
- 178 *International Politics in the Western Hemisphere* (3) Davis
Spring—evening. Political relations of the American Republics in the 19th and 20th centuries, the development of Pan Americanism and the Organization of American States. May not be taken by students who have credit for former Political Science 175.
- 181-82 *International Law* (3-3) Brewer
Academic year—morning and evening; summer 1961—Political Science 181 (3).
Survey of the public law of nations with emphasis on the law of peace. Neutrality and the so-called law of war receive attention in the second semester.
- 187-88 *Current Problems in International Politics* (1-1) Slayman
Academic year—evening. Analysis of outstanding contemporary international issues with discussion of problems and policies.
- 191 *Politics of the Middle East* (3) Nimer
Fall—evening. Domestic and international politics of Turkey, Iran, Israel, and the Eastern Arab States and Principalities. Special attention to the specifically regional aspect of the foreign policies of these countries.
- 192 *Politics of North and Central Africa* (3) Nimer
Spring—evening. Domestic and international politics of the Western Arab States, Ethiopia, Somalia, Liberia, and the newly independent states of former British, French, and Belgian Africa. Special attention to the specifically regional aspect of the foreign policies of these countries.
- 194 *Far Eastern Politics: Contemporary International Relations in the Pacific Area* (3) Kinney
Spring—evening. Background and development of the major states of East Asia with attention to the constitutional systems and the foreign politics of the region.
- 197 *Proseminar in International Affairs* (3) Nimer
Fall—evening; spring—morning; summer 1961. Reading and discussion course for coordination and review. Primarily for seniors in the International Affairs major.

THIRD GROUP

- 205-6 *The Federal Executive* (3-3) R. C. Bain
Academic year—evening. *First half*: nomination and election of the U. S. President, his constitutional and political powers; the cabinet and the Executive Office of the President; the relation of the President to the executive and legislative branches of the government. *Second half*: the practical politics of the presidency, presidential policy leadership and control, the President as party head and as moulder of public opinion.
- 209-10 *Seminar: the Federal Government of the United States* (3-3) West
1961-62 and alternate years: academic year—evening. Advanced research emphasizing legislative problems of Congress and relations of Congress with the Administration.
- 212 *Seminar: Comparative Government* (3) Kraus
Spring—evening. Selected topics and problems on comparative political and administrative institutions and the politics of modern constitutional governments and dictatorships. Each semester is devoted to a selected country or significant institutional or policy problem.

- 213 *Readings in Comparative Government* (3) Kraus
Fall—evening. Readings and group discussions on comparative political and administrative institutions with attention to legislatures, the changing role of the executive, political parties, constitutional and totalitarian approaches to public management and public service, the role of the military, etc.
- 217 *Seminar: Topics in Political Theory* (3) Kraus
Fall—evening. Research and discussion on problems of modern political and constitutional theory, theoretical aspects of representative government, democracy, socialism, and totalitarianism. Each semester is devoted to a separately announced topic, such as socialism and communism, theories of resistance and revolution, problems of democratic theory.
- 220 *Reading Course in Political Theory* (3) Kraus
Spring—evening; summer 1961. Readings and group discussions, principally on modern political and constitutional theory since the 17th and 18th centuries.
- 221-22 *Seminar: The Constitution of the United States* (3-3) West
1962-63 and alternate years. Selected topics in the development of the law of the Constitution. Primary attention will be given to the development of "due process of law" in the courts.
- 235 *Metropolitan Problems* (3) H. M. Bain
Fall—evening. Growth of American cities and changing land use patterns in relation to internal transportation systems. The respective roles of the private automobile and of public transportation. The problems of financing and administering public transportation systems under public and private ownership.
- 245-46 *The American Political Process: Political Parties and Interest Groups* (3-3) LeBlanc
Academic year—evening; summer 1961—Political Science 245 (3). *First half:* readings and group discussions on the nature and functions of political parties and the role and techniques of political interest groups. *Second half:* seminar on selected topics of American politics requiring the use of basic research materials.
- 271-72 *Problems in International Politics and Organization* (3-3) Ludden
Academic year—evening. A seminar to develop techniques of research in recent international affairs and to examine developments in international politics and organizations.
- 273 *Public Opinion and Foreign Policy* (3) Ludden
Fall—evening. Development, organization, and operation of international information programs by major world powers. Public opinion in the United States influencing the formation and conduct of foreign policy.
- 274 *Methods and Objectives of Foreign Policy* (3)
Spring—evening. Examination of the objectives of foreign policies of the major powers, with attention to political, economic, and military methods used to pursue these objectives.
- 277 *Seminar: Latin American Government* (3) Davis
Fall—evening; summer 1961. Analysis of the political structures of selected Latin American republics. Two comparable governments studied each year.
- 278 *Seminar: Latin American Political Philosophy* (3) Davis
Spring—evening. Research in political personalities and philosophies of 19th and 20th century Latin America.
- 279 *Reading Course in International Affairs* (3)
Fall—evening; summer 1961. Reading and discussion of basic materials designed to stimulate investigation of problems in the nature and development of international law, politics, and organization.

- 281-82 *Seminar: International Law and Relations* (3-3) Brewer
First half: not offered 1961-62. Second half: spring-evening. Research in the public law of nations, with special attention to problems of pacific settlement, sanctions, war, neutrality, and state jurisdiction, and to their political implications.
- 292 *International Politics and Government in the Middle East* (3) Nimer
Spring-evening. Research and analysis of the international relations and major political problems of the Arab world and adjacent areas.
- 293-94 *Seminar: International Politics and Government in the Pacific Area* (3-3) Kinney
Academic year-evening. Research and analysis of the major patterns of development in internal and international politics of the area, with advanced study of the governmental institutions of the Far East.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1961.

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above the University offers the following courses, which are available to students enrolled in the following programs. Others admitted only by special permission of the Executive Officer.

AIR FORCE ADVANCED MANAGEMENT PROGRAM

- 287 *American Military Policy* (3) Stanley
Examination of the nature of military policy and its relation to domestic and foreign policy, the historical element, organization within the military establishment for policy making.

ARMY WAR COLLEGE PROGRAM

- 285 *Diplomacy Since World War II* (3) Jordan
Academic year—evening. Recent changes in diplomatic procedures and objectives as compared with those of earlier periods.

NATIONAL WAR COLLEGE PROGRAM

- 283 *Topics in International Law* (3) Brewer
A consideration of theory, problems, and cases in the public law of nations, including the law of peace and the law of war.

PSYCHIATRY*

- Professors* Winfred Overholser (*Emeritus*), Leon Yochelson (*Executive Officer*)
Clinical Professors Joel Elkes, J. D. Schultz, D. C. Cameron, F. A. Freyhan
Associate Clinical Professors H. P. Laughlin, M. deG. Ruffin, Sidney Berman, Morris Kleinerman, Elmer Klein, Anna Todd, Norman Taub
Assistant Professor J. E. Rankin
Assistant Clinical Professors Harold Corson, Sarah Tenenblatt, Richard Schaengold, Leon Ferber, P. H. Gray, David Eden, C. T. Bever, C. E. Goshen, Joseph Abrahamson
Associates R. M. Greenberg, Helen Pallister, W. C. Johnson, W. D. Kehne, H. A. Meyersburg
Clinical Instructors R. A. Rogers, J. A. Farrell, S. C. Gordon, H. B. Lehrman, R. A. Frank, Maxwell Boverman, Helen Percy, A. M. Drummond, G. W. Sprehn,

* The Staff of Instruction here listed is for the academic year 1960-61.

N. C. Rintz, Leslie Schaffer, J. L. Sheridan, L. J. Duhl, G. W. Metcalf, S. L. Werkman, D. W. Harris, A. H. Kiracofe, Jr., T. M. Mackenzie, B. W. Murphy, Daniel Prager, F. N. Waldrop, J. H. Bouma, Jean Menetrez

Special Lecturer R. H. Felix

165 Introductory Medical Psychology

Berman

Fall—1 hour a week. An orientation course in the anatomical, physiological, and psychological growth and development of personality. Consideration of characteristics of structure, function, and development of the psyche leading to normal behavior as a basis for the study of the pathological. Evaluation of interpersonal relationships.

178 Psychopathology

Rankin

Spring—1 hour a week. Manifestations and understanding of various mental mechanisms and abnormal reaction-types, preceded by history of development of psychopathology and illustrated with case material.

266 Psychiatry

Yochelson

Spring—1 hour a week. Psychiatry in the practice of Medicine. Techniques of interviewing.

268 Demonstration Clinics

The Staff

Spring—3 hours a week. History, etiology, symptoms, course, and treatment of the major psychoses with emphasis on the dynamics involving the person as a whole. Presentation of clinical cases of major mental illnesses and primary behavior disturbances. St. Elizabeths and D. C. General hospitals.

272 Psychosomatic Aspects of General Medicine

Ruffin

Spring—1 hour a week. Somatic disorders of psychogenic origin. The role of personality reactions in functional and organic disorders.

324 Psychoneurosis

Ferber

Spring—1 hour a week. Etiology, psychopathology, clinical aspects, and treatment of various types of psychoneuroses. Medical Conference Room, D. C. General Hospital.

431-32 Clinical Clerkship

The Staff

Three weeks divided service as arranged during academic year. Supervised examination, diagnosis, and treatment of ambulatory cases in University Hospital and hospitalized cases in St. Elizabeths Hospital. Conferences for discussion of cases. Clinical application of psychiatric principles to general medical practice is stressed. University Hospital Inpatient and Outpatient Psychiatric clinics and St. Elizabeths Hospital.

PSYCHOLOGY*

Professors Mitchell Dreese, Thelma Hunt (Executive Officer), D. C. Faith

Professorial Lecturers H. F. Hubbard, Margaret Ives

Associate Professors C. E. Tuthill, W. E. Caldwell†, J. N. Mosel, R. D. Walk, Eva Johnson, C. W. Hill

Associate Professorial Lecturer J. G. Colmen

Lecturer C. J. Lindley

Associate W. R. Kotapish

Bachelor of Arts with a major in Psychology (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51-52, including Psychology 1, and 4 or 22 or 29.

The general requirements for the degree are stated on pages 61-65. The sixty required

* The Staff of Instruction here listed is for the academic year 1960-61.

† On sabbatical leave spring semester 1960-61.

semester hours must include twenty-seven hours in Psychology in addition to those taken as prerequisites, including Psychology 98, 118, 131, 151 or 171, 191, and 196; and Statistics 53.

*Master of Arts or Master of Science in the field of Psychology (Columbian College).—*Prerequisite: the degree of Bachelor of Arts with a major in Psychology at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 66-69. Of the twenty-four required semester hours (exclusive of the thesis), a minimum of eighteen must be in third-group courses; a minimum of twelve must be in psychology including Psychology 201 and 202; twelve may be in related fields approved by the Department.

Master's programs are available in the following fields of concentration: (1) tests and measurements, (2) counseling and guidance, (3) clinical-abnormal, (4) social, (5) personnel, (6) experimental, and (7) personality. For detailed requirements consult the Executive Officer of the Department.

*Doctor of Philosophy (Graduate Council).—*See page 73.

*Master of Arts in Government or Master of Business Administration in the field of Personnel Administration including options in Counseling and Psychometrics (School of Government, Business, and International Affairs).—*See pages 144-45.

*Master of Arts in Education in the fields of Employee Training and of Guidance (School of Education).—*Prerequisite: a Bachelor's degree from an accredited institution and two years of successful teaching experience. The requirements for the degree are stated on pages 127-29.

FIRST GROUP

- 1 *General Psychology** (3) The Staff
Fall—morning and evening; spring—morning and evening; summer 1961. The fundamental principles underlying human behavior.
- 4 *Psychology of Adjustment* (3) The Staff
Fall—morning and evening; spring—morning and evening; summer 1961. Processes involved in the total adjustment of the individual with emphasis on social environment; development in the individual of adjustment techniques.
- 22 *Introduction to Educational Psychology* (3) Lindley, Faith
Fall—evening; spring—morning; summer 1961. Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.
- 29 *Child Psychology* (3) Johnson
Fall—morning; spring—evening. A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world.
- 98 *Abnormal Psychology* (3) ———, Hunt
Fall—morning and evening; spring—morning; summer 1961. The causes, diagnosis, treatment, and prevention of the various types of maladjustments and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science.

SECOND GROUP†

- 112 *Adolescent Psychology* (3) Johnson
Fall—evening. Psychological characteristics and problems peculiar to adolescence, with emphasis on applications of psychology to solution of such problems.
- 118 *Physiological Psychology* (3) Hill
Fall—evening; spring—morning; summer 1961. Structure, function, and phylogeny of receptors, nervous system, and effectors as mediators of behavior, including drives, learning, and emotions.
- 121 *Educational Psychology* (3) Lang
Spring—evening. Advanced course in educational psychology. Designed for those with background in education and psychology.

* Psychology 1 is prerequisite to all other courses in Psychology.

† Six credits in first-group courses are prerequisite to all second-group courses.

- 129 *Introduction to Counseling and Guidance* (3) Dreese
Fall—evening; summer 1961. A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.
- 131 *Psychological Tests* (3) _____, Hunt
Fall—morning; spring—evening; summer 1961. A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, \$7.
- 141 *Leadership, Group Behavior, and Student Life* (3) Faith
Fall—morning. A survey of the foundations of leadership, of the factors which underlie effective participation in group activities, and of the interrelations between the student and his university.
- 144 *Personnel Psychology* (3) Hubbard, Mosé
Fall—evening; spring—evening. Psychological concepts and techniques in personnel management and supervision. Applications to government, industry, and military organizations.
- 146 *Psychology of Human Relations* (3) Mosé
Fall—morning. Consideration of the problems and process in interpersonal relations and small-group behavior. Emphasis is on interpersonal communication and perception, psycholinguistics, and cross-cultural relations.
- 148 *Psychology of Advertising and Consumer Behavior* (3) Mosé
1962-63 and alternate years. The motivational and social processes in economic behavior. Consideration of current techniques and findings in motivational research. Evaluation of the effectiveness of mass media, public relations programs, and strategies of persuasion.
- 151 *Social Psychology* (3) Tuthill
Fall—evening; spring—morning; summer 1961. The social foundations of attitudes and behavior. Individual adjustment to group situations, such as the family, school, fraternity, and occupation. The psychological basis of race prejudice, nationalism, and war.
- 156 *Psychology of Propaganda and Public Opinion* (3) Tuthill
Spring—evening. The psychology of opinion formation, the measurement of opinion, the social determinants of attitudes, the psychological processes in propaganda, the bases of receptivity of propaganda, psychological warfare.
- 161 *Comparative Psychology* (3) Caldwell
Spring—morning. A lecture course in animal psychology. Covers psychological processes in infrahuman organisms, evolution of behavior, the place of animal experimentation and research in psychology.
- 162 *Experimental Comparative Psychology* (3) Caldwell
Fall—as arranged; spring—as arranged. Opportunity for individual psychological experimentation using lower animals as subjects. Offered on independent study plan. Prerequisite: Psychology 161 and permission of the instructor.
- 191 *Experimental Psychology* (3) Walk
Fall—afternoon and evening; spring—afternoon and evening. The application of experimental methods to various psychological problems. Prerequisite: 12 credits in psychology and an elementary course in statistics. Material fee, \$10.
- 192 *Problems in Experimental Psychology* (3) Walk
Fall—as arranged; spring—as arranged. Opportunity for work on individual experimental projects. Prerequisite: Psychology 191 and permission of the instructor.
- 193-94 *Readings in Psychology* (3-3) The Staff
Academic year—as arranged; summer 1961—Psychology 193 (3). Supervised readings on specific topics in psychology, with conferences, for undergraduate majors. Open only to seniors with 18 or more credits in psychology with a quality-point index of 3.00 or higher. Admission by special permission of the instructor.

196 *History and Systems of Psychology* (3)

Caldwell

Fall—afternoon; spring—evening; summer 1961. A survey of the contemporary schools of psychology. Prerequisite: 12 credits in psychology.

THIRD GROUP*

201 *Seminar: Advanced General Psychology* (3)

Hill

Fall—afternoon; spring—evening; summer 1961. General review of the field for graduate students with an intensive study of selected problems. Required in all graduate programs.

202 *Psychological Research Methods and Procedures* (3)

Walk

Fall—evening; spring—afternoon; summer 1961. Required in all graduate programs. Prerequisites: Experimental Psychology and an elementary course in statistics.

207-8 *Readings in Psychology for Graduate Students* (3-3)

The Staff

Academic year—as arranged; summer 1961—Psychology 207 (3). Supervised readings with conferences on specified topics in psychology. Open only to students who have had course work in the field of the readings.

209 *Seminar: Psychology of Motivation* (3)

Caldwell

Fall—evening. A consideration of various theoretical approaches to the psychology of motivation and systematic concepts and experimental findings deriving from each approach.

212 *Personality Evaluation by Projective Techniques* (3)

_____, Ives

Fall—evening; spring—evening. Primary emphasis upon administration and scoring of the Rorschach Test. Prerequisite: Psychology 233.

213 *Clinical Psychometrics* (3)

Spring—evening. A study of the clinical applications of nonprojective tests. Prerequisite: Psychology 233.

215 *Advanced Study of Projective Techniques* (3)

Ives

Fall—evening. Primary emphasis upon interpretation of the Rorschach Test. Prerequisite: Psychology 212.

217 *Seminar: Developmental Psychology* (3)

Fall—afternoon.

218 *Seminar: Clinical Psychology—Psychopathology* (3)

Fall—afternoon. Covers basic etiological factors in behavioral and psychological deviations and disorders.

219 *Seminar: Clinical Psychology—Psychotherapy* (3)

Spring—afternoon. Covers theoretical principles underlying psychotherapy, techniques and procedures, and problems of evaluation.

220 *Seminar: Abnormal Psychology* (3)

Hunt, _____

Fall—afternoon; spring—evening. An intensive study of selected problems in the field of abnormal psychology.

223 *Seminar: Learning* (3)

Walk

Spring—evening. Covers research and theory in the psychology of learning.

225 *Seminar: Mental Hygiene* (3)

Fall—evening; spring—afternoon. A study of mental health problems with special attention to needs of counselors.

226 *Seminar: Clinical Psychology of Childhood and Adolescence* (3)

Johnson

Spring—evening. A survey of behavior and personality disorders.

* Open only to graduate students, except by special permission of Instructor and Executive Officer of the Department.

- 227 *Seminar: Counseling and Guidance* (3) Dreese
Spring—evening. Recent developments and current problems in vocational, educational, and personal guidance in various types of agencies with particular reference to education. Prerequisite: educational or psychological measurements and Psychology 129 or the equivalent.
- 228 *Seminar: Techniques of Counseling* (3) Dreese
Fall—evening; spring—evening. An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling problems will be discussed. Prerequisite: 12 semester hours in testing and guidance, including Psychology 229 and 236. In exceptional cases Psychology 229 or 236 may be taken concurrently with 228.
- 229 *Seminar: Occupational and Educational Information* (3) Faith
Fall—evening; spring—evening; summer 1961. Designed to acquaint vocational and educational counselors with the basic occupational and educational information necessary in counseling. Sources of data and techniques of collecting, analyzing, and disseminating for purposes of guidance.
- 231 *Test Construction* (3) Mosé
Fall—evening. The principles underlying test construction; statistical techniques in the construction, evaluation, and standardization of psychological, educational, and vocational tests. Prerequisite: a course in tests and measurements and an elementary course in statistics.
- 232 *Research: Test Construction* (3) Hunt
Fall—as arranged; spring—as arranged. Individual projects in construction and evaluation of psychological, educational, or vocational tests. Prerequisite: Psychology 231 and permission of the instructor.
- 233 *Individual Psychological Testing* (3) Johnson
Fall—afternoon; spring—afternoon. Instruction and practice in giving of the Binet and Wechsler tests. Prerequisite: an elementary course in tests and measurements. Material fee, \$7.
- 234 *Seminar: Test Theory* (3) Mosé
1962-63 and alternate years. Development of the axiomatic-deductive theory underlying the major notions in the construction, evaluation, and application of psychological tests.
- 235 *Seminar: Psychological Measurement* (3) Hunt
Spring—evening. Advanced instruction in the use and interpretation of psychological tests, with emphasis upon group tests; survey of recent research in psychological measurement. Prerequisite: a course in psychological or educational measurement.
- 236 *Seminar: Analysis of the Individual for Purposes of Counseling* (3) Faith
Fall—evening; spring—evening; summer 1961. A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: an introductory course in educational or psychological measurements.
- 244 *Seminar: Job Analysis and Evaluation* (3) Mosé
Summer 1961.
- 245 *Seminar: Employee Motivation and Morale* (3) Mosé
Spring—evening. An analysis of organizational behavior, especially with regard to motivation and productivity. The implications of recent research on employee attitudes, the primary group, the effects of various patterns of supervisory leadership, the role of formal and informal organization, and job design.
- 246 *Seminar: Personnel Measurement Techniques* (3) Mosé
Fall—evening. Detailed consideration of the techniques of personnel selection and performance evaluation. The use of employment tests, personal data, assessment interviews, and performance ratings.

- 249 *Seminar: Human Engineering* (3)
 Fall—evening. Application of findings and methods of experimental psychology to design and operation of equipment and man-machine systems. Relation of capacities of the operator to information display systems, control mechanisms, work environment, and work methods.
- 251 *Seminar: Advanced Social Psychology* (3) Tuthill
 Fall—evening. Current research and theory in social psychology; group dynamics, ego-involvements, action research, and social interaction theory.
- 254 *Seminar: Group Dynamics* (3) Tuthill
 1961-62 and alternate years: spring—evening. The experimental study of small groups; autocratic and democratic group climates; interaction process analysis; Lewin's field-theoretical approach to individual and group processes.
- 255 *Seminar: Techniques of Opinion and Attitude Measurements* (3) Tuthill
 1962-63 and alternate years. Methods of attitude measurement (interviews, questionnaires, scales, polls) as currently used by private and governmental investigators. The place of attitude studies in schools, industry, government, etc.
- 258 *Applied Social Psychology* (3) Mosél
 Spring—evening. The development of personality, personality adjustment, nature of communication and interaction; structure and functioning of groups, group dynamics, opinion and attitude formation, and opinion and attitude measurement. Classroom activity supplemented by practical observations and projects. Open only to graduate students in hospital administration, engineering administration, and other graduate administrative programs.
- 261 *Seminar: International Communication* (3) Mosél
 1961-62 and alternate years: spring—evening. The communication process, problems in mass communication, measuring and modifying opinions and attitudes, principles of persuasion, psychological warfare.
- 262 *Dynamics of Social Change* (3) Lippitt
 Spring—afternoon. Current research and theory related to the process of social change. Basic principles of planned change will be explored in connection with individual, group, organization, community, and cultural change. Human factors in the change process will be emphasized.
- 272 *Seminar: Theories of Personality* (3) Caldwell
 Fall—evening. A survey of the various theories of personality, with emphasis upon theoretical problems and methodology in the field of personality study.
- 281-82 *Practicum in Counseling* (3-3) The Staff
 Academic year—as arranged; summer 1961—Psychology 281 (3). Supervised practical instruction in agencies doing counseling. Prerequisite: graduate work in counseling. Admission by permission of the Executive Officer of the Department.
- 283-84 *Practicum in Clinical Psychology* (3-3) The Staff
 Academic year—as arranged; summer 1961—Psychology 283 (3). Supervised practical instruction in agencies doing clinical psychological work. Prerequisite: Psychology 212 and 233. Admission by permission of the Executive Officer of the Department.
- 289-90 *Seminar: Current Research and Theory in Psychology* (3-3)
 Academic year—evening. A review and discussion of contemporary research and theory in some advanced and specialized field of psychological study, by leaders in the field. The specific topic and instructor for each semester will be announced in advance of the beginning of the semester.
- 292 *Seminar: Perception* (3) Walk
 Fall—afternoon. Study of current research and theory in the experimental psychology of perception.

295-96 Research in Psychology (arr.)Academic year—as arranged; summer 1961.
out under supervision of staff member.The Staff
Individual research by student, carried**299-300 Thesis (3-3)**

Academic year—as arranged; summer 1961.

The Staff

COURSE OFFERED IN SPECIAL PROGRAM

In addition to the regular courses announced above the University offers the following course, which is available only to students enrolled in the Engineering Administration program.

145 Principles of Human Relations (3)

Fall—evening; spring—evening; summer 1961.

Kotapish

RADIOLOGY*

Professor W. W. Stanbro (*Executive Officer*)

Assistant Professor W. W. Saunders

Assistant Clinical Professors Charlotte Donlan, S. R. Bersack, H. J. Kicherer, H. L. Berman, J. A. Isherwood, E. R. King

Associates A. C. Wyman, S. W. Smith

Instructor C. F. Murphy

Clinical Instructors George Tievsky, U. V. Wilcox II, C. M. Weber, Nan Van Wagenen

115-16 Anatomy

Academic year—as arranged. Correlation of gross and Roentgen anatomy.

The Staff

220 Principles of Radiology

Spring—1 hour a week. Lectures and discussions.

The Staff

313 Advanced Radiological Diagnosis

Fall—as arranged. Lectures and discussions.

The Staff

421-22 Clinical Studies

Students are assigned to the X-ray Department in rotation on a full-time basis for a specific period.

The Staff

RELIGION*

Professors J. R. Sizoo, C. E. Olmstead (*Executive Officer*)

Associate Professorial Lecturer M. L. Newman

Assistant Professor R. G. Jones

Lecturers C. D. Kean, A. B. Seidman

Bachelor of Arts with a major in Religion (Columbia College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51-52, including Religion 9, 10, and 59-60. Required: the general requirements as stated on pages 61-65, including a minimum of eighteen semester hours in religion beyond first-group courses.

Master of Arts in the field of Religion (Columbia College).—Prerequisite: an undergraduate major in Religion at this University or the equivalent.

Required: the general requirements of Columbia College as stated on pages 66-69. Of

* The Staff of Instruction here listed is for the academic year 1960-61.

the twenty-four semester hours of required courses (exclusive of the thesis), at least twelve must be in third-group religion courses; a maximum of nine may be in a closely related field outside the Department of Religion as approved by the Department.

Master of Arts in the field of Religious Education (Columbian College).—Prerequisite: an undergraduate major in Religion at this University or the equivalent; the following specific courses or the equivalent: Education 109-10; Psychology 1, 22, and 29; Sociology and Anthropology 1; Speech 1 or 11.

Required: the general requirements of Columbian College as stated on pages 66-69. Of the twenty-four semester hours of required courses (exclusive of the thesis), at least six must be in third-group religion courses; a maximum of twelve may be in a closely related field outside the Department of Religion as approved by the Department.

Doctor of Philosophy in the field of the History of Religion in the United States (Graduate Council).—See History, page 73.

FIRST GROUP

- 9 *The Old Testament* (3) Jones and Staff
Fall—morning and evening; summer 1961. A historical and literary approach to the study of the books of the Old Testament with special consideration given to the development of religious ideas, institutions, and outstanding personalities.

- 10 *The New Testament* (3) Jones
Spring—morning and evening; summer 1961. A study of the literature of the New Testament from the standpoint of occasion, purpose, dominant ideas, and permanent values. Special emphasis on the approach, the structure, and the significance of the Gospels and Epistles.

- 59-60 *History of Religion* (3-3) Olmstead and Staff
First half: fall—morning and evening; spring—afternoon; summer 1961. Second half: fall—afternoon; spring—morning and evening. First half: primitive and ancient national religions; Confucianism, Taoism, Buddhism, Hinduism, and Shintoism—their historical setting, founders, and development of religious thought and culture. Second half: Judaism, Christianity, and Islam—analysis of their origin, evolution, and contemporary status.

SECOND GROUP

- 103 *The Prophets, Their Times and Their Message* (3) Seidman
Fall—evening. The development of prophetism in the Old Testament; cultural, economic, psychological, and religious factors in the movement; elements of lasting value in the prophetic teaching. A few of the prophets will be selected for particular study.

- 104 *The Life and Thought of Jesus* (3) Kean
Spring—evening. A comprehensive study of the life and teachings of Jesus as they relate to problems of belief, standards of value, and patterns of life; the significance of the message of Jesus for our own times.

- 105 *The Life and Thought of Paul* (3) Jones
Fall—morning. Greek and Hebrew backgrounds of early Christianity, the Roman world of the first century, religious and social conditions affecting the spread of Christianity, the life and journeys of Paul, Paul's teaching and presentation of the Christian faith, the place of the Pauline epistles in the New Testament.

- 121 *Problems of Western Religious Thought* (3) Olmstead
Not offered 1961-62. The nature of religious truth and experience; the existence, character, and activity of God; the predicament of modern man; the problem of evil and suffering; eternal life; science and religion; the meaning of worship; religious views of history.

- 122 *Christian Ethics and Modern Society* (3) Jones
Not offered 1961-62. The nature and principles of the Christian life as developed by the Christian community; problems of personal conduct; the application of the Christian standard to family, social, and economic institutions.

- 131 *History of Christianity to the Reformation* (3) Olmstead
Fall—morning. The rise and expansion of Christianity, the development of Christian thought, the evolution of church organization and worship, the Renaissance and pre-Reformation dissent.
- 132 *History of Modern Christianity* (3) Olmstead
Spring—morning; summer 1961. The origin and development of Protestantism; the Roman Catholic revival; the status of the Eastern churches; doctrines, worship, expansion, church and state, and relation to modern thought and life.
- 135 *History of Judaism to the Talmud* (3) Jones
Not offered 1961-62. A study of the history and religious thought of the Jewish people from the Maccabean revolt to the compilation of the Talmud.
- 136 *History of Medieval and Modern Judaism* (3) Seidman
Not offered 1961-62. A study of the history and religious thought of the Jewish people from the compilation of the Talmud to the present.
- 141-42 *Religious Education* (3-3) Stone
Academic year—morning. Principles and practices of religious education in the home, church, and community; basic educational procedures and special techniques; organization and administration of religious education.
- 172 *Religion in American Culture* (3) Olmstead
Spring—morning. Growth of religious bodies and institutions in American culture, the heritage of religious freedom and diversity, religion and literature, revivalism and education, science and religious thought, divisions and cooperative movements in religion.
- THIRD GROUP
- 209-10 *Seminar in Biblical Literature* (3-3) Jones
Not offered 1961-62. Study of the main problems of Biblical literary and historical criticism.
- 211-12 *Seminar in Biblical Thought* (3-3) Jones
Academic year—as arranged. Study of the Biblical interpretation of history and reality and its relation to Biblical beliefs about God, man, and the world.
- 231-32 *Seminar in the History of Christian Thought* (3-3) Olmstead
Not offered 1961-62. An advanced study of the development of Christian thought from primitive beginnings to the present.
- 234 *Seminar in Modern Religious Thought* (3) Olmstead
Spring—evening. Analysis of developments in western religious thought from the 18th century to the present.
- 241-42 *Seminar in Religious Education* (3-3)
Not offered 1961-62. Advanced course dealing with some of the major problems in the practice of religious education.
- 271 *Seminar in American Religious History* (3) Olmstead
Fall—evening. Analysis of the main currents in American religious thought.
- 291-92 *Readings and Research* (3-3) The Staff
Academic year—as arranged; summer 1961—Religion 291 (3). Investigation of special problems in the history of religion.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1961.

ROMANCE LANGUAGES AND LITERATURES*

Professors M. I. Protzman, A. T. Deibert (*Emeritus*), Antonio Alonso (*Emeritus*), G. E. McSpadden (*Executive Officer* to February 1, 1961), L. A. Vigneras (*Visiting*)

Associate Professors Rafael Supervia†, J. W. Robb, W. G. Clubb‡, C. Y. Meade, G. E. Mazzeo

Assistant Professors J. L. Metivier, Jr. (*Acting Executive Officer* since February 1, 1961), Carlos Lozano, J. A. Frey

Courses are generally conducted in the language concerned. For Comparative Courses in Romance Languages and Literatures (French, Italian, Portuguese, Spanish) see pages 300-301.

Bachelor of Arts with majors in (1) *French Language and Literature*, (2) *Spanish American Literature*, and (3) *Spanish Language and Literature* (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters curriculum in the Junior College.

Required: the general requirements of Columbian College as stated on pages 61-65 and the grade "pass" on the major examination at the end of the senior year. The coordinated field of knowledge upon which the student will be examined includes the political, social, and cultural backgrounds of the literature studied; the writers and their works. Proficiency in the spoken and written language is required. Majors in Romance Languages are strongly advised to study Latin, a knowledge of which is generally required for graduate work. The Department provides a proseminar in each of the major fields intended to assist the student in his preparation for the major examination.

Master of Arts in the fields of (1) *French Language and Literature*, (2) *Spanish American Literature*, and (3) *Spanish Language and Literature* (Columbian College).—Prerequisite: the degree of Bachelor of Arts in the appropriate field from this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 66-69. The thirty hours of required work must include a thesis, for which six hours of credit are allotted. The remainder of the program is arranged in consultation with the student's major adviser.

Doctor of Philosophy (Graduate Council).—See page 72.

Bachelor of Arts in Education with teaching fields in French and in Spanish (School of Education).—Prerequisite: the Education curriculum, pages 53-54.

Required: the French option or the Spanish option and the professional courses listed in the School of Education Catalogue.

FRENCH

FIRST GROUP

1-2 First-year French (3-3)

The Staff

A year course; credit is not given for the first half until the second half is completed.

First half: fall—morning and evening; spring—morning and evening; summer 1961.

Second half: fall—morning and evening; spring—morning and evening; summer 1961.

For beginners. Pronunciation, conversation, grammar, composition, reading of modern French prose. Aural training, oral practice in electronic language workshop.

Workshop fee, \$6 a semester.

3-4 Second-year French§ (3-3)

The Staff

A year course; credit is not given for the first half until the second half is completed.

First half: fall—morning and evening; spring—morning and evening; summer 1961.

Second half: fall—morning; spring—morning and evening; summer 1961. Conversation, grammar, composition, reading in modern French prose, introduction to French civilization. Aural training, oral practice in electronic language workshop.

* The Staff of Instruction here listed is for the academic year 1960-61.

† On sabbatical leave fall semester 1960-61.

‡ On leave of absence 1960-61.

§ French 3-4 is required, and French 51-52 is recommended, as prerequisite to all second-group courses.

Workshop fee, \$6 a semester. Prerequisite: French 1-2 or two years of high school French.

9-10 *French Conversation and Composition* (3-3)

The Staff

Academic year—morning and evening; summer 1961. Prerequisite: French 4 or the equivalent and permission of the instructor.

49 *French Readings for Nonmajor Students* (3)

Meade and Staff

Fall—evening; spring—evening; summer 1961. Primarily for graduate students preparing for reading examinations. Undergraduates admitted only with specific permission of the instructor. No academic credit for graduate students.

51-52 *Survey of French Literature and Civilization** (3-3)

Metivier

Academic year—morning. The social, artistic, and cultural background of French civilization. Lectures, readings, recitations, and informal discussions.

SECOND GROUP*

109-10 *Advanced French Conversation and Composition* (3-3)

Meade

Academic year—morning. Normally diction will receive greater emphasis in the fall semester and style in the spring semester. Prerequisite: French 10 or the equivalent and permission of the instructor.

119-20 *French Literature of the Sixteenth Century* (3-3)

1961-62 and alternate years: academic year—morning. Prose, poetry, drama, and memoirs of the French Renaissance; Rabelais, Montaigne, Marot, La Pléiade, etc. Class analysis of texts, collateral reading. Recommended: History 120.

121-22 *French Literature of the Seventeenth Century* (3-3)

1962-63 and alternate years. History, philosophy, criticism, memoirs, letters, eloquence, drama, fiction, poetry. Class analysis of texts; collateral reading.

123-24 *French Literature of the Eighteenth Century* (3-3)

Deibert

1961-62 and alternate years: academic year—evening. History, philosophy, criticism, letters, drama, fiction, poetry, the "salons", the idea of progress, the idea of science. Class analysis of texts, collateral reading, lectures on literature and history.

125-26 *French Literature of the Nineteenth Century* (3-3)

Frey

1962-63 and alternate years. Romanticism and realism: fiction, poetry, drama, criticism. Class analysis of texts, collateral reading, lectures on literature and history.

127-28 *French Literature of the Twentieth Century* (3-3)

Clubb

1961-62 and alternate years: academic year—evening. Fiction, poetry, drama, criticism. Class analysis of texts, collateral reading, lectures on literature and history.

129-30 *Contemporary French Literature* (3-3)

Clubb, Meade

Summer 1961—French 130 (3). Existentialism and surrealism in the novel, poetry, and drama from 1938 to the present. Lectures, discussions, and reports.

199-200 *Proseminar: Readings for the Major in French Literature* (3-3)

Clubb

Academic year—as arranged. Conferences and group discussions.

THIRD GROUP

201 *Doctoral Seminar I†* (3)

The Staff

Fall—afternoon. Introduction to the doctoral program. Advanced methodology in the Romance languages and literatures.

203 *Explication de textes†* (3)

Meade

Offered 1962-63. An introduction to the analytical study of French literature. The method will be demonstrated and practiced with selected passages.

* French 3-4 is required, and French 51-52 is recommended, as prerequisite to all second-group courses.

† This course was first given in the academic year 1959-60.

- 205 *Problems of Teaching French Language and Literature in College* (3) The Staff
Fall—afternoon. For candidates for the degree of Doctor of Philosophy. Principles and problems of learning and teaching the language and literature. Apprenticeship in college classes and the language laboratory.
- 224 *La Crise de la conscience européenne (1680-1749)** (3) Meade
Offered 1962-63. Bayle, Fontenelle, Montesquieu, Voltaire, Diderot, and the Encyclopedists as philosophers, dramatists, novelists, and critics of their age; an assessment of their contributions to the intellectual evolution of France and Europe.
- 225 *Seminar: Realism and Naturalism* (3) Meade
Offered 1963-64. Special studies in poetry, the novel, and the drama.
- 226 *Seminar: the Social Novel of the Twentieth Century* (3) Meade
Offered 1963-64. Studies in the works of Malraux, Saint-Exupéry, Montherlant, Céline, and others.
- 227-28 *Seminar: Modern French Literature* (3-3)
1962-63 and every third year. Prerequisite: a second-group course in French literature.
- 229-30 *Seminar: Classical French Literature* (3-3)
1962-63 and every third year. Prerequisite: a second-group course in French literature.
- 235 *Seminar: the Renaissance in Europe* (3) Clubb
Spring—afternoon. The sources and nature of literary trends from Dante to Calderón, and their relationship to French literature.
- 239 *Introduction to Romance Philology and Linguistics* (3)
See Comparative Courses in the Romance Languages and Literatures.
- 240 *Historical French Grammar** (3)
1962-63 and every third year. Study of phonology, morphology, and syntax of Old French, including its development from Vulgar Latin. Practical exercises based on texts. Prerequisite: a second-group course in French literature, Romance 239 *Introduction to Romance Philology and Linguistics* (see Comparative Courses), and an elementary knowledge of Latin.
- 243 *Problems of Pronunciation and Intonation* (3)
Fall—afternoon.
- 249-50 *Old French* (3-3)
Offered 1963-64. Survey of French literature to the end of the 13th century. Prerequisite: a second-group course in French literature, Romance 239 *Introduction to Romance Philology and Linguistics* (see Comparative Courses), and an elementary knowledge of Latin.
- 251 *Middle French* (3)
Offered 1963-64. French literature of the 14th and 15th centuries. Class analysis of texts, collateral reading. Prerequisite: a second-group course in French literature. Knowledge of Old French is desirable.
- 276 *Seminar: Flaubert* (3) Frey
Spring—afternoon.
- 285 *Seminar: Proust* (3) Meade
Fall—afternoon.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged.

* This course was first given in the academic year 1959-60.

PORTUGUESE

FIRST GROUP

1-2 *First-year Portuguese* (3-3)

A year course: credit is not given for the first half until the second half is completed. Not offered 1961-62. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Portuguese prose. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester.

3-4 *Second-year Portuguese* (3-3)

A year course: credit is not given for the first half until the second half is completed. Not offered 1961-62. Conversation, grammar, composition, reading of modern Portuguese prose, oral practice, introduction to Portuguese and Brazilian civilization. Prerequisite: Portuguese 1-2 or the equivalent.

SECOND GROUP

127-28 *Portuguese and Brazilian Literature* (3-3)

Not offered 1961-62. Evolution of the Portuguese language; outline of the literature of Portugal (fall semester) and Brazil (spring semester). Lectures, readings, written reports. Conducted in Portuguese. Prerequisite: Portuguese 3-4 or the equivalent.

SPANISH

FIRST GROUP

1-2 *First-year Spanish* (3-3)

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—morning and evening; spring—morning and evening; summer 1961. *Second half:* fall—morning and evening; spring—morning and evening; summer 1961. For beginners. Pronunciation, conversation, grammar, composition, reading of modern Spanish prose. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester.

The Staff

3-4 *Second-year Spanish** (3-3)

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—morning and evening; spring—morning and evening; summer 1961. *Second half:* fall—morning; spring—morning and evening; summer 1961. Conversation, grammar, composition, reading of modern Spanish prose, introduction to Hispanic civilization. Aural training, oral practice in electronic language workshop. Workshop fee, \$6 a semester. Prerequisite: Spanish 1-2 or two years of high school Spanish.

The Staff

9-10 *Spanish Conversation and Composition* (3-3)

Academic year—morning and evening; summer 1961. Prerequisite: Spanish 4 or the equivalent and permission of the instructor.

The Staff

49 *Spanish Readings for Nonmajor Students* (3)

Fall—evening; spring—evening. Primarily for graduate students preparing for reading examinations. Undergraduates admitted only with specific permission of the instructor. No academic credit for graduate students.

Mazzeo, Robb

51-52 *Survey of Spanish Literature and Civilization** (3-3)

Academic year—evening. The social, artistic, and cultural background of Spanish civilization. Lectures, readings, recitations, and informal discussion.

Supervia

SECOND GROUP*

109-10 *Advanced Spanish Conversation and Composition* (3-3)

Academic year—morning. Normally diction will receive greater emphasis in the fall semester and style in the spring semester. Prerequisite: Spanish 10 or the equivalent and permission of the instructor.

Mazzeo

* Spanish 3-4 is required, and Spanish 51-52 is recommended, as prerequisite to all second-group courses in Spanish.

- 121-22 *Spanish Literature of the Golden Age* (3-3)
1961-62 and alternate years: academic year—evening. Lope de Vega, Calderón; the classic drama, the ballad, lyric poetry. Class analysis of texts, collateral reading, lectures on literature and history.
- 123-24 *Cervantes: Don Quijote* (3-3) McSpadden
1962-63 and alternate years. Life of Cervantes. Reading of the *Quijote* and other works of the author. Lectures, discussions, and reports.
- 125-26 *Modern Spanish Literature* (3-3) Mazzeo
1962-63 and alternate years. Prose and poetry of the 18th and 19th centuries. Class analysis of texts, collateral reading, lectures on literature and history.
- 127-28 *Contemporary Spanish Literature* (3-3) Supervía
1961-62 and alternate years: academic year—evening. Prose and poetry of the 20th century. Class analysis of texts, collateral reading, lectures on literature and history.
- 151-52 *The Spanish American Novel* (3-3)
1962-63 and every third year; summer 1961—Spanish 151 (3). Development of the novel in Spanish America. Lectures, collateral reading, and class analysis of texts.
- 155-56 *Spanish American Literature to 1880* (3-3) Robb
1963-64 and every third year. The literature of Spanish America from the colonial period to the latter part of the 19th century. Lectures, collateral reading, reports, and class analysis of important works.
- 157-58 *Spanish American Literature since 1880* (3-3) McSpadden, Robb
1961-62 and every third year: academic year—morning. The literature of Spanish America from 1880 to the contemporary period. Lectures, collateral reading, reports, and class analysis of important works.
- 197-98 *Proseminar: Readings for the Major in Spanish American Literature* (3-3) Robb
Academic year—as arranged. Conferences and group discussions.
- 199-200 *Proseminar: Readings for the Major in Spanish Literature* (3-3) Lozano
Academic year—as arranged. Conferences and group discussions.

THIRD GROUP

- 201 *Doctoral Seminar I** (3) The Staff
Fall—afternoon. Introduction to the doctoral program, advanced study and methodology in the Romance languages and literatures.
- 203 *Explicación de textos** (3)
Offered 1962-63. An analytical introduction to the study of Spanish and Spanish-American literature. The method will be demonstrated and practiced on selected passages.
- 205-6 *Problems of Teaching Spanish Language and Literature in College* (3) The Staff
Academic year—afternoon. For candidates for the degree of Doctor of Philosophy. Principles and problems of learning and teaching the language and literature. Apprenticeship in college classes and the language laboratory.
- 221 *Seminar: Works of Cervantes* (3) McSpadden
Not offered 1961-62. Problems of composition, interpretation, criticism, literary history, and aesthetics.
- 223 *Seminar: Spanish Writers of the Eighteenth Century** (3) Mazzeo
Offered 1962-63.

* This course was first given in the academic year 1959-60.

- 225 *Seminar: Works of Unamuno and Ortega y Gasset* (3) Supervia
Offered 1962-63.
- 227-28 *Seminar: Spanish-American Literature* (3-3) Robb
Offered 1962-63.
- 229 *Seminar: Spanish Romanticism* (3) Mazzeo
Not offered 1961-62. Problems of origins and development.
- 234 *Seminar: Works of Galdós* (3) Supervia
Not offered 1961-62. Ideological and stylistic analysis; relationship of his works to the literary movements of the second half of the 19th century.
- 239 *Introduction to Romance Philology and Linguistics* (3)
See Comparative Courses in Romance Languages and Literatures.
- 240 *Historical Spanish Grammar** (3) McSpadden
Offered 1962-63. Study of phonology, morphology, syntax, and lexicology of Old Spanish, including its development from Vulgar Latin. Practical exercises based on texts. Prerequisite: a second-group course in French literature, Romance 239 *Introduction to Romance Philology and Linguistics* (see Comparative Courses), and an elementary knowledge of Latin.
- 243 *Problems of Pronunciation and Intonation* (3) McSpadden
(Formerly Spanish 226)
Fall—afternoon.
- 249 *Old Spanish* (3) McSpadden
Spring—afternoon. Literature and language: *El poema de Mio Cid*, *El Conde Lucanor*, *El Libro de Buen Amor*, etc. Prerequisite: a second-group course in Spanish literature, Romance 239 *Introduction to Romance Philology and Linguistics* (see Comparative Courses), and an elementary knowledge of Latin.
- 258 *Seminar: Contemporary Spanish-American Poetry* (3) Lozano
Not offered 1961-62. Studies of aesthetic principles and poetic movements. Emphasis on Huidobro, Neruda, and others.
- 275 *Seminar: the Drama of the Golden Age* (3)
Fall—afternoon.
- 286 *Spanish Mystics* (3)
Spring—evening.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged.

COMPARATIVE COURSES IN THE ROMANCE LANGUAGES AND LITERATURES

In addition to the preceding courses in the particular Romance languages and literatures, the following which are especially concerned with comparative aspects of Romance studies are offered.

- 212 *Comparative Romance Languages and Literatures I* Lozano
(Italian) (3) (Replaces Italian 201 *Comparative Italian Language and Literature* (3)*)
Not offered 1961-62. Intensive study of Italian grammar with reference to French, Spanish, and other Romance languages.
- 213-14 *Comparative Romance Languages and Literatures II, III* Clubb
(Italian) (3-3) (Replaces Italian 201 *Comparative Italian Language and Literature* (3)*)
Academic year—afternoon. For candidates for the degree of Doctor of Philosophy. The Italian language and literature from Dante to Goldoni. Lectures, discussions.

* This course was first given in the academic year 1959-60.

- exercises, and readings. Prerequisite: Romance 212 *Comparative Romance Languages and Literatures I* or the equivalent.
- 215-16 *Comparative Romance Languages and Literatures IV, V* (Portuguese)* (3-3) Robb
Not offered 1961-62. For candidates for the degree of Doctor of Philosophy. Lectures, discussions, exercises, and readings.
- 239 *Introduction to Romance Philology and Linguistics*† (3) McSpadden
1962-63 and every third year. Study of principles found in the development of the Romance languages and methods of analysis at the present time. A general course for graduate students in the fields of the Romance languages and literatures. Prerequisite: an elementary knowledge of Latin. This course normally followed by French 240 or Spanish 240.
- 244 *Experimental Phonetics* (3) McSpadden
Spring—afternoon.
- 260 *Introduction to Romance Stylistics* (3) Frey
Not offered 1961-62. Special emphasis will be placed on examples from French and Spanish literature.

SECRETARIAL STUDIES‡

Associate Professor Mildred Shott (*Executive Officer*)
Lecturer Amil Jackowski
Associates W. R. Throckmorton, Ruth Osborne

Associate in Arts (Junior College—two-year vocational curriculum in Secretarial Studies).—For curriculum, see page 57.
Associate in Secretarial Administration (College of General Studies).—See the College of General Studies Catalogue for complete details.
Bachelor of Arts in Education with a teaching field in Business Education (School of Education).—Prerequisite: the Education curriculum, pages 53-54.
Required: the Business Education option and the professional courses listed in the School of Education Catalogue.

FIRST GROUP

- 1 *Elementary Typewriting* (3) Shott and Staff
Fall—evening; spring—evening. Fundamental techniques of typewriting, basic styles of business letters, introduction to tabulation, and preparation of general office forms. Laboratory fee, \$7.
- 2 *Intermediate Typewriting* (3) Shott and Staff
Fall—evening; spring—afternoon and evening. The business letter and its arrangement, advanced tabulation, manuscript typing, office forms, stencil cutting, and legal documents. Prerequisite: Secretarial Studies 1 or the equivalent; ability to type accurately at 30 words a minute. Laboratory fee, \$7.
- 11 *Elementary Shorthand and Transcription* (3) Shott and Staff
Fall—morning and evening; spring—evening. A study of the principles of Gregg shorthand correlated with dictation and transcription. Minimum dictation speed of 60 words a minute attained. Laboratory fee, \$3.
- 12 *Intermediate Shorthand and Transcription* (3) Shott and Staff
Fall—evening; spring—morning and evening; summer 1961. Review of the principles of Gregg shorthand. Dictation and transcription on general and specialized business subjects. Minimum dictation speed of 80 words a minute attained. Prerequisite: Secretarial Studies 11 or the equivalent.

* This course was first given in the academic year 1959-60.
† This course was first offered 1960-61.
‡ The Staff of Instruction here listed is for the academic year 1960-61.

requisite: Secretarial Studies 11 or the equivalent; ability to take dictation at 60 words a minute. Laboratory fee, \$5.

- 15 *Advanced Shorthand, Typewriting, and Transcription* (3) Shott
 Fall—morning; summer 1961. Dictation and transcription involving vocabularies in specific businesses. Minimum speed of 100 words a minute attained in dictation. Prerequisite: Secretarial Studies 12 or the equivalent. Laboratory fee, \$5.
- 16 *Secretarial Shorthand, Typewriting, and Transcription* (3) Shott
 Spring—morning. Dictation and transcription involving vocabularies used in the legal and medical professions. Minimum dictation speed of 120 words a minute attained. Prerequisite: Secretarial Studies 15 or the equivalent. Laboratory fee, \$5.
- 51 *Business Correspondence* (3) Shott
 1961-62 and alternate years: fall—evening; 1962-63 and alternate years: fall—morning. Development of the technique of effective communication with reference to business letters and forms. Survey and analysis of current business literature.
- 54 *Secretarial Practice* (3) Shott
 Spring—morning. A thorough study of secretarial problems and procedures. Practice in the use of secretarial equipment and supplies. The study of secretarial personality and office relationships.

SLAVIC LANGUAGES AND LITERATURES*

Associate Professor Helen Yakobson (Executive Officer)

Assistant Professor E. E. Pantzer III

Lecturers E. S. Serebrennikov, Kiril Jaszenko, Natalie Clarkson, George Olkhovsky

Bachelor of Arts with a major in Russian (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51-52.

Required: in addition to the general requirements of Columbian College as stated on pages 61-65, eighteen semester hours in Slavic Languages and Literatures and in History, to be selected from Slavic Languages and Literatures 91-92, 141-42, 151-52, and History 143-44, 145-46; and either Slavic Languages and Literatures 101-2 or 103-4. (The requirement of a second-group Russian language course may be met by satisfactory passing of an examination. The six hours thus waived will be made up by electing from the literature and history courses.)

FIRST GROUP

1-2 *First-year Russian* (3-3)

Yakobson and Staff

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—morning and evening; spring—evening; summer 1961. *Second half:* fall—evening; spring—morning and evening; summer 1961. A beginners' course in fundamentals of grammar and pronunciation with graded reading, oral drill, and written practice. Listening comprehension and oral practice in electronic language workshop. Workshop fee, \$6 a semester.

3-4 *Second-year Russian* (3-3)

Yakobson and Staff

A year course: credit is not given for the first half until the second half is completed. *First half:* fall—morning and evening; spring—evening. *Second half:* fall—evening; spring—morning and evening. Systematic review of grammar. Study of special problems of Russian morphology and syntax. Oral and written reports on assigned topics. Workshop fee, \$6 a semester.

9-10 *Russian Conversation* (3-3)

Yakobson and Staff

Academic year—evening. Listening comprehension and oral practice. Prerequisite: Russian 3-4 or permission of the instructor. Workshop fee, \$6 a semester.

* The Staff of Instruction here listed is for the academic year 1960-61.

91-92 *Introduction to Slavic Literature* (3-3)

Pantzer

Academic year—morning. Lecture, recitation, and discussion. *First half*: a survey of Russian literature in translation from early written and oral forms through the literary masterpieces of the 19th century. *Second half*: selected readings in the history of other Slavic literatures, 18th through 20th centuries, with emphasis on the contemporary scene.

SECOND GROUP

101-2 *Rapid Readings in Russian* (3-3)

Pantzer

Academic year—evening. Representative Russian readings in the social sciences and periodical literature.

103-4 *Scientific Russian* (3-3)

Serebrennikov

1962-63 and alternate years. Reading and translation of technical texts.

141-42 *Russian Literature of the 19th Century* (3-3)

Pantzer

1962-63 and alternate years. Lectures, special reports, class analysis of selected works of 19th century Russian literature—in Russian. Prerequisite: Russian 1-2; 3-4.

151-52 *Russian Literature of the 20th Century* (3-3)

Pantzer

1961-62 and alternate years: academic year—evening. Lectures, special reports, class analysis of selected works of 20th century Russian literature—in Russian. Prerequisite: Russian 3-4.

SOCIOLOGY AND ANTHROPOLOGY*

Professor H. L. Geisert† (Executive Officer)

Associate Professor R. W. Stephens

Assistant Professors J. M. Campbell, Samuel Baum

Lecturer Jane Wickey

Bachelor of Arts with a major in Sociology and Anthropology (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51-52, including six hours in first-group courses in Sociology and Anthropology.

Required: in addition to the general requirements of Columbian College as stated on pages 61-65, twenty-four semester hours in Sociology and Anthropology, which must include 172 and 181 and six hours selected from Sociology and Anthropology 115, 116, 142, 143, 152, 153, 155.

Master of Arts in the field of Sociology and Anthropology (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in Sociology and Anthropology in this University, or the equivalent.

Required: the requirements of Columbian College, as stated on pages 66-69. The thirty hours of required work must include a minimum of eighteen hours in third-group courses.

FIRST GROUP

1-2 *Man in Modern Society*† (3-3)

The Staff

First half: fall—morning and evening; spring—morning; summer 1961. *Second half*: fall—morning; spring—morning and evening. Development of culture and personality, the impact of groups and institutions on man's social behavior. Factors producing social problems; individual, community, national, and international disorganization.

51 *Introduction to Anthropology*† (3)

Campbell, Gallagher§

Fall—morning and evening; spring—morning and evening. Physical development of fossil and living man, races of mankind, the origin and growth of civilization; the structure and development of human relationships.

* The Staff of Instruction here listed is for the academic year 1960-61.

† On leave of absence fall semester 1960-61.

‡ Sociology and Anthropology 1 or 51 is prerequisite to all other courses in Sociology and Anthropology.

§ Appointment effective September 1961.

SECOND GROUP

- 115 *Cultural Anthropology* (3)
1962-63 and alternate years. Development of social life and customs in preliterate societies, universals, and aspects of culture, theories relating to culture, society, and personality.
- 116 *Native Peoples of the New World* (3) Gallagher
1961-62 and alternate years: spring-evening. A survey of representative Indian groups of the Americas from primitive bands to high civilizations, stressing the patterned nature of diverse cultural responses to universal problems of human existence.
- 123 *Fields of Social Work* (3) Wickey
1961-62 and alternate years: fall-morning. Introduction to the nature and scope of social work; the development of social work program; functions of social case work, social group work, and social action.
- 124 *Medical Sociology* (3) Geisert
1961-62 and alternate years: spring-morning. Sociological factors and processes which relate to physical and mental health and disease; analysis of patterned social relationships in the field of health and medicine; the hospital as a social system.
- 126 *Urban Sociology* (3)
1962-63 and alternate years. The place of the city in the larger society: growth of the city, problems of urban living, group life, personality, urban housing, and city planning. Includes consideration of suburban development.
- 127 *Community Organization* (3) Campbell
1961-62 and alternate years: fall-morning. Principles common to communities throughout the world: social interaction and social disorganization, population growth and community structure, spatial organization, community change.
- 131 *Social Institutions* (3)
1962-63 and alternate years. Functional analysis of basic social institutions: family, education, religion, economy, and state in the structure of American society.
- 132 *Courtship and Marriage* (3) Wickey
Spring-morning. Dating and courtship as social processes, reasons for marriage, marriage laws, mate selection, factors in marital adjustment; prediction and counseling.
- 133 *The Family in Modern Society* (3) Baum
Fall-morning. Historical development of the family as a social institution, parent-child relations, family problems, disorganization and divorce, and family reorganization.
- 134 *Sociology of Child Development* (3) Stephens
1962-63 and alternate years; summer 1961. Socialization of the child through the home and other social institutions; the changing status of childhood, dependent and handicapped children.
- 135 *Juvenile Delinquency* (3)
1962-63 and alternate years. Factors producing delinquency, juvenile detention, the juvenile court, training schools, treatment of offenders.
- 136 *Criminology* (3)
1962-63 and alternate years. Nature and distribution of crime, police and court systems, prisons and reformatories; treatment and prevention of crime.
- 141 *Population Problems* (3)
1962-63 and alternate years. Composition of populations, trends in population growth and population pressure, factors producing population movements, effects of migration, population policies; eugenics and birth control.

* Appointment effective September 1961.

- 142 *Race and Culture Configurations* (3) Gallagher*
Spring—morning. The biological background; the origin and races of mankind, and the social and cultural effects of concepts of race.
- 143 *Language and Culture* (3) Gallagher*
1961-62 and alternate years: fall—evening. The nature and significance of human communication, the distribution and dynamics of languages, linguistic changes, the role of language in culture.
- 144 *Mass Communications* (3) Baum
Spring—morning. The communications process; barriers to communication; structure and function of communication in society; content, control, support, and effects of mass communication.
- 151 *Human Relations in Industry* (3) Stephens
Fall—evening. Sociological analysis of work situations, occupational mobility, development of the labor movement, industrial leadership and morale.
- 152 *Dynamics of Culture* (3)
1962-63 and alternate years. Factors and processes making for stability and change in cultures; "the nature and characteristics of cultural growth invention, diffusion, and acculturation"; the integration and disintegration of cultures.
- 153 *Culture and Personality* (3) Gallagher§
Fall—morning; summer 1961. Influences of group membership and cultural conditions on personality; socio-cultural factors in mental health; the relationship of personality to class, caste, and occupation.
- 155 *Applied Anthropology* (3)
1962-63 and alternate years. The application of anthropological methods and techniques in the modern world. The use of applied anthropology in specific fields, including government, business, law, and medicine.
- 161 *Social Stratification: Class and Status* (3)
1962-63 and alternate years. Nature of class structure patterns of status, prestige relations in American society, differential class behavior, analysis of comparative social structure and social mobility.
- 162 *Social Movements* (3)
1962-63 and alternate years. Major contemporary movements examined as aspects of social change and collective behavior. Designed to disclose competing ideologies and show the way social movements develop.
- 164 *Social Control* (3) Campbell
1961-62 and alternate years: spring—evening. Informal and formal phases of human control, analysis of methods of control used in modern society and the situations in which they occur, policies and techniques of control.
- 172 *Contemporary Social Theory* (3) Stephens
Spring—morning. Systematic study of the important schools of contemporary sociology, including recent European as well as American developments; an evaluation of the scientific contributions of each school.
- 181 *Methods of Social Research* (3) Geisert
Fall—morning. Analysis of social research techniques and the scientific method; application to social data of the case study, social survey, statistical, sociometric, and experimental methods.
- THIRD GROUP
- 221 *Seminar: Current Trends in Sociology* (3)
1962-63 and alternate years. Analysis and evaluation of recent developments in sociology and an appraisal of the role of systematic theory in sociology.
- 222 *Seminar: Anthropological Theory* (3)
1962-63 and alternate years. Analysis of the theoretical postulates and assumptions underlying the development of modern cultural and social anthropology.

* Appointment effective September 1961.

- 223 *Cultural Origins of the Western Hemisphere* (3) Campbell
1961-62 and alternate years: fall—evening. An examination of the problems of the nature and time of Early Man's entry to the Americas; the development of Paleo Indian societies, stressing their varied cultural adjustments to diverse environments.
- 224 *Anthropological Methods* (3) Gallagher[†]
1961-62 and alternate years: spring—evening. Traditional approaches to library and field research in linguistics, archeology, and ethnography; conceptual bases and bias in the delineation of problems, in the selection, analysis and organization of data, and in the preparation of the final report.
- 225 *Seminar: Small Groups* (3) Geisert
1961-62 and alternate years: fall—evening. General characteristics of small groups and their measurement; sociography of groups, evaluation of small group theory and sociometry; other techniques of small group research.
- 226 *Problems of Underdeveloped Areas* (3) Geisert
1961-62 and alternate years: spring—evening. Characteristics and problems of underdeveloped areas; the interrelationship of demographic, economic, social, and cultural factors; measures and techniques to introduce cultural changes.
- 295-96 *Research* (arr.) The Staff
Academic year—as arranged; summer 1961.
- 299-300 *Thesis* (3-3) The Staff
Academic year—as arranged; summer 1961.

SPEECH†

Professors L. P. Leggette (*Executive Officer*), C. W. Pettit‡ (*Director of Speech Clinic*), G. F. Henigan, Jr.

Associate Professors E. L. Stevens, Lee Bielski

Lecturers Edith Surrey, A. A. Nilles, S. L. Berlinsky, Isabel Burger, R. M. Wenley, J. C. Teegarden

Associate Joan Regnell

Bachelor of Arts with a major in Speech (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51-52, including Speech 1, 2, 11, 32.

Required: the general requirements of Columbian College as stated on pages 61-65, including the passing of a speech proficiency test early in the program. Speech 101, 121, 151, 171, and a minimum of twelve additional hours in second-group courses in the speech arts or speech science, as approved by the adviser.

Bachelor of Arts with a major in Dramatic Art (Columbian College—Departmental).—Prerequisite: the Arts and Letters curriculum in the Junior College, see pages 51-52, including twelve hours in the basic courses in speech and six hours in English 51-52, 71-72, or 91-92.

Required: the general requirements of Columbian College as stated on pages 61-65, including the passing of a speech proficiency test early in the program. Speech 101-2, a minimum of nine additional hours in theater arts in the Speech Department and nine hours in dramatic literature in the English Department, as approved by the adviser.

Master of Arts in the field of Speech Correction (Columbian College).—Prerequisite: the degree of Bachelor of Arts with a major in Speech from this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 66-69.
Master of Fine Arts in the field of Dramatic Art (Columbian College).—Prerequisite: the degree of Bachelor of Arts from this University, or the equivalent.

* Appointment effective September 1961.

† The Staff of Instruction here listed is for the academic year 1960-61.

‡ On sabbatical leave spring semester 1960-61.

Required: the general requirements of Columbian College as stated on pages 66-69, twelve hours of second- and third-group courses in drama and dramatic literature offered on campus, and twelve hours in theatre offered at the Arena Stage.

Four semesters in residence are required to complete this program. For detailed information, consult the Executive Officer of the Department.

Bachelor of Arts in Education with a teaching field in Speech (School of Education).—Prerequisite: the Education curriculum, pages 53-54.

Required: the Speech option and the professional courses listed in the School of Education Catalogue.

FIRST GROUP

A *Speech Clinic*

Bielski and Staff

Fall—as arranged; spring—as arranged; summer 1961. Individual or group lessons, without academic credit, for such speech difficulties as lisping, cleft palate, articulatory problems, and stuttering. Fee: for individual lesson, \$7; for group lesson, \$4.

B *American Speech for Foreign Students* (3)

Bielski

Fall—morning and evening; spring—morning and evening; summer 1961. Class limited to foreign-born students. Instruction in the formation of the sounds of spoken English, with emphasis on rhythm and inflection. The International Phonetic Alphabet is used. Recording fee, \$5.

1 *Effective Speaking* (3)

Leggette and Staff

Fall—morning, afternoon, and evening; spring—morning, afternoon, and evening; summer 1961. Preparation and delivery of extemporaneous speeches, developing confidence and poise, body and voice control; selecting and organizing material. Recording fee, \$2.

2 *Persuasive Speaking* (3)

Henigan and Staff

Fall—morning; spring—morning and evening. A continuation of Speech 1, which is prerequisite, with emphasis on speech composition and elementary principles of persuasion.

11 *Voice and Diction* (3)

The Staff

Fall—morning, afternoon, and evening; spring—morning, afternoon, and evening; summer 1961. Developing ease, naturalness, and clarity in the speaking voice. Analysis of individual voices through recordings. Phonetic approach to the study of the sounds of English, the standards of speech. Class instruction in the problems of rate, volume, pitch, and quality. Recording fee, \$4.

32 *Oral Reading* (3)

Leggette and Staff

Fall—afternoon; spring—afternoon and evening; summer 1961. Reading to others, theory and practice in the problems of interpreting the printed page. Prerequisite: Speech 11. Recording fee, \$2.

SECOND GROUP

101 *Voice and Phonetics* (3)

Bielski

Fall—evening. The International Phonetic Alphabet and its applications to the student's own speech improvement; also personal application to such fields as theater, public speaking, speech correction, radio, television, and foreign languages. Prerequisite: Speech 11. Recording fee, \$4.

102 *Oral Interpretation of Literature* (3)

Leggette

Spring—afternoon. Theory and practice in the problems of communicating meaning and emotion. Selections for study include poetry and prose. Prerequisite: Speech 32. Recording fee, \$2.

111 *Effective Speech Communication* (3)

Bielski

Summer 1961. The tools and principles of effective speech communication, including practice in the organization, delivery, and the evaluation of presentations commonly encountered by professional personnel. Not open to speech majors.

- 121 *Group Discussion and Conference Leadership* (3) Stevens
Fall—morning; spring—evening; summer 1961. The process of thinking and problem solving in committees and small groups, and the methods of leading discussions and conferences. Prerequisite: 6 hours of speech or the permission of the instructor.
- 126 *Public Discussion and Debate* (3) Henigan
Spring—afternoon. Principles and types of public discussion and debate; practice in argumentative speaking on questions of current interest. Prerequisite: 6 hours of speech or the permission of the instructor.
- 133-34 *Radio and TV Broadcasting* (3-3) Wenley
Academic year—evening. A study of the development of the radio and TV industries, station organization and management, equipment, production techniques; practice in the preparation and performance of radio programs. Admission by permission of the instructor. Recording fee, \$5 a semester.
- 141 *Public Speaking: Advanced Forms* (3) Henigan
Not offered 1961-62. The preparation and presentation of speeches for formal occasions with emphasis on the psychology of the audience. Prerequisite: 6 semester hours of speech.
- 145 *Speech Criticism* (3) Henigan
Fall—afternoon. A study of rhetorical theory with application to the criticism of representative American and British oratory. Admission by permission of the instructor.
- 153 *Acting* (3)
Fall—evening. Study and practice in the fundamentals of acting technique. Prerequisite: Speech 32. Laboratory fee, \$5.
- 154 *Play Production* (3)
Spring—evening. Fundamentals of play production. Under the supervision of the instructor, students prepare one-act plays for presentation. Admission by permission of the instructor. Laboratory fee, \$5.
- 155-56 *Play Production Practice* (1-1) The Staff
Academic year—as arranged. Practical work in theater.
- 166 *History of the Theater* (3) Nilles
Not offered 1961-62. A general survey of the rise of the theater, the Classical, Medieval, Renaissance, later English and Continental, and the Modern theater. Admission by permission of the instructor.
- 169-70 *Creative Dramatics and Children's Theater* (3-3) Burger
Academic year—evening. A study of creative dramatics and its use as a learning tool, with problems and experience in producing children's plays.
- 171 *Introduction to Speech Correction* (3) (Formerly Speech 175) Pettit
Fall—afternoon; summer 1961 (as Speech 175). A survey of the disorders of speech, including symptomatology, testing, causation, and therapy.
- 173-74 *Speech Therapy* (3-3) Bielski
Academic year, afternoon. Clinical techniques and procedures involved in the correction of the disorders of speech. Prerequisite: Speech 101.
- 176 *Speech Correction* (3) Pettit
Fall—afternoon. Advanced study of the disorders of speech. Prerequisite: Speech 171 and 173.
- 177-78 *Clinical Practice in Speech Therapy* (1-1) The Staff
Academic year—as arranged; summer 1961. Supervised case work in remedial speech—the University Speech Clinic, Children's Hospital, District of Columbia Crippled Children's Society, and Public School system. Weekly meetings to discuss therapeutic techniques for the common speech problems. This course may be repeated for a total of 6 semester hours. Prerequisite: Speech 101, 173, and permission of the instructor.

- 182 *Hearing Problems and the Testing of Hearing* (3) Teegarden
 Spring—evening. A study of the field of audiology with emphasis on the testing of hearing.
- 183-84 *Clinical Practice in Hearing Therapy* (1-1) The Staff
 Academic year—as arranged; summer 1961. Supervised case work with persons handicapped with hearing losses—the University Speech Clinic, the Washington Hearing Society, and Children's Hospital. This course may be repeated for a total of 3 semester hours. Prerequisite: Speech 182 and permission of the instructor.

THIRD GROUP

- 251 *Rehearsal and Performance* (3) Arena Stage Staff
 Fall—as arranged; spring—as arranged. A course putting into practice the principles and techniques of acting through participation in play rehearsals and performances at the Arena Stage. Admission by audition or interview.
- 254 *Directing Problems* (3) Arena Stage Staff
 Fall—as arranged; spring—as arranged. Observation and participation in solving the problems involved in directing plays. Admission by interview.
- 255 *Techniques of Staging* (3) Arena Stage Staff
 Fall—as arranged; spring—as arranged. Application of theory and principles of scene design, costuming, lighting, make-up, and related stage techniques. Admission by interview.
- 263 *Theater Management* (3) Arena Stage Staff
 Fall—as arranged; spring—as arranged. Theory and practice in the psychology of handling the public: promotion, box office and house management. Admission by interview.
- 264 *Producing Problems* (3) Arena Stage Staff
 Fall—as arranged; spring—as arranged. Problems involved in producing community and professional theater. Admission by interview.
- 279 *Speech Science* (3) Berlinsky
 Not offered 1961-62. The anatomy, physiology, physics, and psychology of speech production, with a survey of experimental work.
- 280 *Speech Pathology* (3) Pettit
 Fall—evening. An advanced study of the causes and symptoms of the major physiogenic and psychogenic disorders. Prerequisite: Speech 171 and 176.
- 284 *Speech Reading and Auditory Training* (3) Teegarden
 Not offered 1961-62. Theory and practice in speech reading and auditory training with an analysis of methods used for the instruction of hearing handicapped children and adults. Prerequisite: Speech 182.
- 286 *Seminar in Speech Pathology* (3) Pettit
 Spring—evening.
- 294 *Research in Dramatic Art* (arr.) The Staff
 Spring—as arranged.
- 295-96 *Research in Speech and Hearing* (arr.) The Staff
- 299-300 *Thesis* (3-3) The Staff

COURSE OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses the University offers the following course, which is available to personnel in the U. S. Navy and Marine Corps.

- 111 *Effective Speech Communication* (3)

RELATED COURSES IN OTHER DEPARTMENTS

- English 125, *Introduction to English Linguistics* (3)
 English 135-36, *Shakespeare* (3-3)
 English 175-76, *American Drama* (3-3)
 English 183-84, *The English Drama* (3-3)
 English 235-36, *Studies in Shakespeare and His Contemporaries* (3-3)
 Education 134, *Student Teaching in Secondary Schools* (6-9)

STATISTICS*

Professors F. M. Weida (*Emeritus*), E. H. Johnson, H. F. Bright (*Executive Officer*)
 Professorial Lecturers Solomon Kullback, H. L. Stier
 Associate Professorial Lecturers Samuel Greenhouse, Seymour Geisser
 Lecturer Morton Kupperman
 Instructor R. E. Thomas

Bachelor of Arts or Bachelor of Science with a major in Mathematical Statistics (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, see pages 51 and 52. Electives must include Mathematics 12, 29, and 30; Statistics 91.

Required: the general requirements of Columbian College as stated on pages 61-65, including Mathematics 31; Statistics 117, 118, 155, 157-58, and six additional hours of second group Statistics courses selected with the approval of the adviser; a minimum of twenty four semester hours of courses in other departments approved by the adviser as contributing to a well-organized program; and the grade of "pass" on the major examination at the end of the senior year. For further details, consult the adviser.

Master of Arts or Master of Science in the field of Mathematical Statistics (Columbian College).—Prerequisite: a Bachelor of Arts or Bachelor of Science degree, respectively, with a major in Mathematical Statistics at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 66-69. The required twenty four semester hours, in addition to a thesis in Statistics, include at least twelve hours to be selected from approved third-group courses in Statistics. The remaining twelve hours must be selected in consultation with the adviser.

Doctor of Philosophy (Graduate Council).—See page 74.

Bachelor of Business Administration or Master of Business Administration with a major in Business and Economic Statistics (School of Government, Business, and International Affairs).—See pages 134, 138, 139-40, 142.

FIRST GROUP†

51 *Introduction to Business and Economic Statistics* (3)

Lecture (2 hours), laboratory (2 hours). Fall—morning and evening; spring—morning and evening; summer 1961. Survey of elementary principles and procedures for presenting, analyzing, and interpreting statistical data; consideration of characteristic values; measures of variability, sampling processes, index numbers, time series analysis, and simple correlation. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

The Staff

* The Staff of Instruction here listed is for the academic year 1960-61.
 † Of first-group courses, Statistics 51, 53, and 91 are related in their subject matter, and credit hours for only one of the three may be applied toward a degree. Statistics 52 lies outside of this group, and may be taken for degree credit in combination with any one of the other three.

52 Mathematics of Finance (3)

The Staff

Lecture (2 hours), laboratory (2 hours). Fall—morning and evening; spring—morning, afternoon, and evening. Interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

53 Introduction to Statistics in Psychology and Education (3)

The Staff

Lecture (2 hours), laboratory (2 hours). Fall: lecture—morning and evening, laboratory—afternoon and evening; spring—morning and evening; summer 1961. Sources of data, tabulation, charts and graphs, averages, dispersion, quartiles and percentiles, raw scores and derived scores, frequency distributions, reliability and validity of tests, normal curve, correlation, elementary sampling, and an introduction to estimation and tests of hypotheses. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

91 Principles of Statistical Methods* (3)

Thomas

Fall: lecture (2 hours), laboratory (2 hours)—evening; spring—morning; summer 1961. Variates and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

SECOND GROUP

104 Statistics in Psychology and Education I (3)

Bright

Fall: lecture (2 hours), laboratory (2 hours)—Saturday morning. Introductory study of statistical techniques necessary for application of statistics in research problems in psychology and education. Laboratory fee, \$9.

105 Statistics in Psychology and Education II (3)

Bright

Spring: lecture (2 hours), laboratory (2 hours)—Saturday morning; summer 1961. Advanced study of statistical techniques necessary for an application of statistics in research problems. Analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 53 or 104. Laboratory fee, \$9.

106 Factor Analysis (3)

Not offered 1961-62. Matrix theory as applied to factor analysis, introduction to the concepts of factor analysis and their utility in various phases of research. Prerequisite: Statistics 53 or the equivalent. Laboratory fee, \$9.

107 Statistics for Engineers (3)

The Staff

Fall—evening; spring—evening; summer 1961. Simple probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, nonparametric tests. Emphasis on engineering applications. Prerequisite: differential and integral calculus.

109 Managerial Statistics (3)

Not offered 1961-62. Role of statistics and the contribution of statistical procedures in various phases of business management with emphasis on the need for and usefulness of the statistical method rather than the mechanics of analysis. Subject matter comprises sources and methods for collecting data, effective forms of presentation, techniques for summarizing and analyzing quantitative and qualitative information, interpretation, of and inferences from available data. Admission by permission of the instructor or following Statistics 51.

110 Quality Control Techniques (3)

Not offered 1961-62. Applications of probability and distribution theory to industrial control problems; use of quality control charts; acceptance sampling plans; estimation of lot and process characteristics. Prerequisite: Statistics 51 or permission of instructor.

* Statistics 91 is for Statistics majors, for students in engineering and in the biological and physical sciences.

- 111 *Business and Economic Statistics I* (3) Johnson
Fall—morning and evening. Statistical processes as related to the problems of business and economic research with emphasis on decision making under conditions of uncertainty. Topics include averages, dispersion, analysis of variance, correlation, quality control, and index numbers. Prerequisite: Statistics 51 or permission of instructor.
- 112 *Business and Economic Statistics II* (3) Johnson
Spring—morning and evening. Specific problems of business and economics with statistics as a tool of analysis. Introduction to principles and use of linear programming, game theory and queueing theory techniques. Study of various economic relationships, including demand, supply, cost and price functions. Prerequisite: Statistics 111 or equivalent.
- 117 *Analysis of Variance I* (3) Thomas
Lecture (2 hours), laboratory (2 hours). Fall—evening; summer 1961. The analysis of variance to segregate factors producing significant variation; a method to estimate experimental error, multiple classifications, Latin Square, Greco-Latin Square, factorials; an introduction to model theory. Prerequisite: Statistics 91. Laboratory fee, \$9.
- 118 *Correlation and the Chi-square Test I* (3) Thomas
Lecture (2 hours), laboratory (2 hours). Spring—evening. Regression and correlation theory: simple, partial, and multiple; nonparametric methods; analysis of covariance; contingency table analysis; tests of goodness of fit. Prerequisite: Statistics 91. Laboratory fee, \$9.
- 121 *Index Numbers* (3) Johnson
Not offered 1961–62. Definition and theory of index numbers, methods of construction, their interpretation, use, and limitations. Prerequisite: Statistics 51 or the equivalent.
- 122 *Forecasting Principles and Techniques* (3) Johnson
Spring—morning. Survey and appraisal of techniques for measuring the state of business conditions and an examination of current indicators. Study of procedures for estimating future values: budget requirements, price levels, or level of general business activity. Prerequisite: Statistics 51 or the equivalent.
- 123 *Introduction to Econometrics* (3) Johnson
Fall—afternoon. A basic quantitative approach to fundamental problems in economic theory involving the use of statistical processes, simple model construction, and probability considerations. Prerequisite: elementary course in Economics and Statistics.
- 155 *Introduction to Mathematical Probability* (3) The Staff
Fall—morning; spring—evening; summer 1961. Probability distributions, Bayes' theorem and postulate, Bernoulli's theorem and its experimental verification, mathematical expectation, laws of large numbers. Prerequisite: permission of instructor.
- 157–58 *Mathematical Statistics* (3–3) Kupperman
Academic year—morning and evening. Distribution theory, sampling theory, estimation, hypothesis testing, confidence methods, regression analysis, experimental design. Prerequisite: differential and integral calculus.
- 189–90 *Mathematical Probability and Applications* (3–3) Greenhouse
Academic year—evening. Combinatorial analysis, conditional probability and stochastic independence, probability distributions, laws of large numbers, recurrent events, random walks, Markov chains, simple time-dependent stochastic processes. Prerequisite: Statistics 155 or permission of instructor.
- 191 *Statistical Mathematics I** (3) Bright
Fall—evening. Problems in statistics with the development of processes from modern algebra necessary for their solution. Prerequisite: differential and integral calculus or permission of instructor.

* Statistics 191, 193, and 194 or the equivalent are prerequisite to all third-group courses.

- 192 *Statistical Mathematics II* (3) Bright
Lecture (2 hours), laboratory (2 hours). Spring—evening. Linear computations as applied to least squares, multiple correlation, regression, and analysis of variance problems. Prerequisite: Statistics 191 or the equivalent. Laboratory fee, \$9.
- 193 *Statistical Mathematics III** (3) Bright
Spring—evening. Problems in statistics with the development of real variable theory necessary for their solution. Prerequisite: differential and integral calculus.
- 194 *Statistical Mathematics IV** (3) Bright
Fall—evening. Problems in statistics with the development of complex variable theory necessary for their solution. Prerequisite: differential and integral calculus.
- 195-96 *Reading and Research in Business and Economic Statistics* (3-3) Johnson
Academic year—as arranged. Admission by permission of the instructor.
- 199-200 *Proseminar: Theoretical and Applied Statistics* (3-3) The Staff
Academic year—as arranged. In addition to the study of recent advances in statistical methods, this course is designed to coordinate the content of the baccalaureate major. Admission by permission of the instructor.

THIRD GROUP*

- 201 *Design of Experiments* (3) _____
Spring—evening. Relative merits of random, repeated, stratified, and double sampling; Fisher-Pitman method of randomization; randomized blocks; Latin squares; factorial design; confounding, partial confounding.
- 203-4 *The Theory of Econometrics* (3-3)
A year course: credit is not given for the first half until the second half is completed. Not offered 1961-62. Statistical methods applied to analysis of production, supply, and demand; utility and disutility; interest and taxation; exchange. Emphasis on interpretation of results in terms of probability, correlation, and regression of time series. Admission by permission of the instructor.
- 205-6 *Advanced Business and Economic Statistics* (3-3)
Not offered 1961-62. Application of statistical methods to specific problems utilizing case method when possible. Emphasis on source materials, role of statistical methods, techniques of analysis, interpretation and presentation of results. Original work is required of each student. Prerequisite: Statistics 112 or the equivalent.
- 207 *Operations Analysis* (3)
Not offered 1961-62. Basic concepts and techniques of operations analysis as applied to problems in business management and economic research. An introduction to the processes of linear programming, game theory, and queueing theory. Admission by permission of the instructor.
- 211 *Theory of Sampling* (3)
Not offered 1961-62. Fall—1963. Problems of sampling and sample design. Admission by permission of the instructor.
- 212 *Nonparametric Statistical Inference* (3)
Not offered 1961-62. Spring—1964. Statistical inference when the form of the underlying distribution is unknown; sign tests; rank order statistics; theory of runs; nonparametric discriminant analysis.
- 217 *Analysis of Variance II* (3) _____
Fall—evening. Advanced theory of the applications of the linear hypothesis to research problems. Distributions of the analysis of variance. Extensions to multiple classifications with unequal cell frequencies. Studies of multiple contrasts and their importance. Normal versus non-normal problems.

* Statistics 191, 193, and 194 or the equivalent are prerequisites to all third-group courses.

218 Correlation and the Chi-square Test II (3)

Not offered 1961-62. Spring 1965. Theoretical analysis of simple, partial, and multiple regression. Examination of various distributions encountered. Rank correlation techniques and their distributions. Distribution of the chi-square statistic.

257-58 Advanced Mathematical Statistics (3-3)

Kupperman

Academic year—evening. Random variables and probability distributions, distribution functions and their properties, convergence theorems, regression and correlation, multivariate normal distribution, asymptotic and exact sampling distributions, estimation, hypothesis testing.

259-60 Advanced Mathematical Probability (3-3)

Kullback

A year course, credit is not given for the first half until the second half is completed. Academic year—evening. Modern theories and asymptotic laws: elementary theory of definite integration; limit theorems in probability.

263-64 Statistical Inference (3-3)

A year course, credit is not given for the first half until the second half is completed. Not offered 1961-62. Academic year 1962-63. Sample space; methods for estimating population parameters; fiducial inference and its application to testing hypotheses; valid, efficient, and exact estimation; Student's distribution; variance distribution; sampling statistics. Prerequisite or concurrent registration: Statistics 257-58 or the equivalent.

265-66 Multivariate Analysis (3-3)

Kullback

A year course, credit is not given for the first half until the second half is completed. Academic year—evening. Tests of significance, generalized variance and covariance, tests of independence, canonical and vector correlations, multivariate, normal distribution, generalized Student's ratio, problems of estimation, applications to factor analysis.

267-68 Characteristic Functions (3-3)

A year course, credit is not given for the first half until the second half is completed. Not offered 1961-62. Fourier integrals, set functions, inversion formulas, limit theorems, applications to the distribution problem in statistics.

269 Sequential Testing (3)

Not offered 1961-62.

270 Statistical Decision Theory (3)

Not offered 1961-62.

271-72 Statistical Information Theory (3-3)

A year course, credit is not given for the first half until the second half is completed. Not offered 1961-62. Basic concepts, definitions, and formulas of information theory; their significance and general properties. Shannon's coding theorem, channel capacity, and transmission of information; inequalities of information theory and sufficiency; applications to statistical problems of discrimination and hypothesis testing. Asymptotic distribution theory of information; analysis of contingency tables; loss of information due to grouping and sequential analysis; comparison or experiments.

273-74 Stochastic Processes (3-3)

A year course, credit is not given for the first half until the second half is completed. Not offered 1961-62. Academic year 1962-63. Fundamental notions of stochastic processes; random walks; Markov processes; differential processes; Gaussian processes; applications.

295-96 Reading and Research (3-3)

The Staff

Academic year—as arranged. Admission by permission of the instructor.

299-300 Thesis (3-3)

The Staff

COURSES OFFERED IN SPECIAL PROGRAMS

In addition to the regular courses announced above the University offers the following courses for students enrolled in the following special programs: Navy Grad-

uate Comptrollership Program, Air Force Advanced Management Program, Engineering Administration, and Hospital Administration.

101 Basic Principles of Statistical Methods (3)

Variables and attributes, averages and dispersion, elementary principles of sampling, introduction to the making of statistical decisions.

119 The Bases of Statistical Decision Making (arr.)

Introduction to the techniques of decision making, with emphasis on applications rather than theory. Includes: binomial distribution, normal distribution, Type I and II errors, estimation, research methodology, and problems of inference.

120 Principles of Statistical Analysis (3)

Introduction to the basic concepts of statistical analysis, measures of central tendency, dispersion, normal distribution, basic statistical inference including estimation and testing hypotheses.

262 Managerial Statistics and Quality Control (3)

The application of statistical principles and practices to management and quality control. Emphasis is placed on the use of statistical techniques in making management decisions, controlling quality and standardization. Prerequisite: Statistics 107 or the equivalent.

SURGERY*

Professors Brian Blades (*Executive Officer*), C. T. Klopp

Clinical Professors W. S. McCune, V. M. Iovine, Alec Horwitz, G. A. Higgins, Jr.

Associate Professor P. C. Adkins

Associate Clinical Professors J. P. Adams, G. S. Letterman

Assistant Professors H. C. Pierpont, N. P. D. Smyth

Assistant Clinical Professors B. F. Dean, Jr., Carl Berg, J. S. Neviaser, J. B. Harrell,

L. T. Peterson, H. L. Feffer, J. R. Thistlethwaite, Thomas Bradley, Murdock Head

Associates W. R. Morris, J. J. Weinstein, W. C. Meloy, K. H. Wood, Isabella Harrison, Maxine Schurter

Instructors T. C. Alford, Jacob Rosenweig

Clinical Instructors C. D. Briggs, J. F. Conlon, D. C. Richtmeyer, Leon Gerber,

E. A. Gould, A. B. Rohrbaugh, Jr., M. H. Kendrick, B. G. Brown, J. D. Hoyle,

R. R. Smith, N. H. Isaacson, C. S. White, Jr., D. P. McCarty, J. M. Keshishian,

R. L. Dow, L. R. Perna, T. M. Wright, D. C. Wherry, J. H. Sager, Frances Brennecke

101-2 Surgical Anatomy I

Surgery and Anatomy Staffs

Academic year—1 hour alternate weeks, as arranged. Clinics illustrating relationship between gross anatomy and clinical surgery. University Hospital.

284 Surgical Physiology

The Staff

Spring—2 hours a week. A clinical and laboratory course with particular emphasis on applied physiology.

323-24 Surgical Pathology I

Weiss

Academic year—1 hour a week. Weekly conferences are held with the student group assigned to the surgical clerkship, reviewing surgical specimens.

373-74 Clinical Clerkship I

The Staff

Academic year—as arranged. The student is assigned and required to work up thoroughly the cases for diagnosis and treatment. D. C. General Hospital.

* The Staff of Instruction here listed is for the academic year 1960-61.

- 375-76 *Outpatient Surgical Clinic* The Staff
Forty hours as arranged during academic year. Surgical clinic. D. C. General Hospital.
- 377 *Fractures and Orthopedics* The Staff
Fall—1 hour a week. Lectures covering the field of fractures and orthopedics. D. C. General Hospital.
- 379-80 *Lectures in Surgery* The Staff
Academic year—2 hours a week. D. C. General Hospital.
- 383-84 *Surgical Clinic* Blades
Academic year—1 hour a week. Demonstration of various surgical diseases to the entire class. University Hospital.
- 473-74 *Clinical Clerkship II* The Staff
Academic year—in rotation. Six weeks, University Hospital; three weeks, Mt. Alto Hospital.
- 479-80 *Surgical Staff Conferences* The Staff
Academic year—Wednesday as arranged. University Hospital.
- 483-84 *Surgical Ward Rounds* Blades
Academic year—1 hour a week. Demonstration of various surgical diseases to fourth-year clerks. University Hospital.
- 491 *Surgical Anatomy II* Horwitz and Staff
Fall—I hour a week for twelve weeks in rotation. Lectures for fourth-year clerks. University Hospital.
- 492 *Surgical Pathology II* Newman
Spring—1 hour a week. A systematic study of the gross and microscopic changes in the organs and tissues commonly removed surgically.

UROLOGY*

Clinical Professors L. R. Culbertson (*Executive Officer*), E. E. Ferguson
Assistant Clinical Professors W. D. Jarman, F. T. Reuter
Associates Gilbert Ottenberg, G. R. MacDonald
Clinical Instructors H. D. Wolff, Jr., H. P. Dorman, H. A. Goldberg, W. D. Oldham, John Kenealy

- 395-96 *Clinic* The Staff
Clinical teaching and demonstrations on the care of urological patients with special emphasis on the pre- and post-operative management. Operative clinics and clinical teaching. D. C. General Hospital.
- 397 *Urology* The Staff
Fall—1 hour a week. Lectures covering the entire field of urology including diagnosis, treatment, and morbid pathology.
- 495-96 *Clinic* The Staff
Three hours a week, in rotation, as arranged during academic year. Clinical demonstrations, teaching in the Outpatient Department, and urological X-ray conferences, with special attention given to diagnostic procedures. University Hospital.

* The Staff of Instruction here listed is for the academic year 1960-61.

ZOOLOGY*

Professors I. B. Hansen (*Executive Officer*), Edith Mortensen
 Professorial Lecturer K. C. Kates
 Associate Professor A. H. Desmond
 Lecturer J. R. Buchheit

Bachelor of Arts or Bachelor of Science (Columbian College—Field-of-Study).—Prerequisite: the Arts and Letters or the Science curriculum, respectively, in the Junior College, see pages 51-52. The following first-group courses must be included: Zoology 1-2 and Chemistry 11-12.

Required: the general requirements of Columbian College as stated on pages 61-65, and the grade "pass" on the Zoology major examination at the end of the senior year. The correlated knowledge upon which the student will be examined includes the following fields: (1) classification, structure, and ecological relations of animals, both invertebrate and vertebrate; (2) embryological development and life histories of important animal types; (3) general principles of physiology, heredity, and evolution; (4) the development of biological principles, hypotheses, and theories as revealed in the study of the history of zoology.

Master of Arts or Master of Science in the field of Zoology (Columbian College).—Prerequisite: the degree of Bachelor of Arts or Bachelor of Science, respectively, with a major in Zoology at this University, or the equivalent.

Required: the general requirements of Columbian College as stated on pages 66-69.

Doctor of Philosophy (Graduate Council).—See page 75.

FIRST GROUP

1-2 *Introduction to Zoology* (4-4)

Mortensen, Hansen

Academic year: lecture (2 hours)—morning and evening, laboratory (4 hours)—morning, afternoon, and evening; summer 1961. An introduction to the study of the structure, functions, and relation of animals, and of the fundamental biological principles involved. Material fee, \$11 a semester.

41-42 *Comparative Vertebrate Anatomy* (3-3)

Desmond

Lecture (1 hour), laboratory (4 hours). 1961-62 and alternate years: academic year—morning; 1962-63 and alternate years: academic year—morning and evening. Lectures on the organ systems of the vertebrates, laboratory dissections of types. Prerequisite: Zoology 2. Material fee, \$11 a semester.

SECOND GROUP

101-2 *Invertebrate Zoology* (3-3)

Mortensen

Lecture (1 hour), laboratory (4 hours). 1961-62 and alternate years: academic year—afternoon; 1962-63 and alternate years: academic year—evening. A systematic study of invertebrate forms, including the morphology, classifications, life histories, and phylogenetic relationships. Occasional field trips. Prerequisite: Zoology 1-2 or Biology 1-2. Material fee, \$8 a semester.

105 *Entomology* (3)

Munson

Lecture (1 hour), laboratory (4 hours). 1961-62 and alternate years: fall—morning. A study of the elementary morphology, physiology, and ecology of insects, with an introduction to the taxonomy of the more important groups. Prerequisite: Zoology 1-2 or the equivalent. Material fee, \$8.

138 *Histology* (3)

Desmond

Lecture (1 hour), laboratory (4 hours). 1961-62 and alternate years: spring—evening; 1962-63 and alternate years: spring—afternoon; summer 1961. An introduction to the microscopical anatomy of normal tissues and organs. Prerequisite: Zoology 1-2 or the equivalent. Material fee, \$11.

* See also the departments of Biology and Botany.
 The Staff of Instruction here listed is for the academic year 1960-61.

145 Introduction to Vertebrate Embryology (3)**Hansen**

Lecture (1 hour), laboratory (4 hours). 1961-62 and alternate years: fall—afternoon and evening; 1962-63 and alternate years: fall—afternoon. Origin and early development of the individual, formation of organ systems. Emphasis on the frog, chick, and pig, with reference to the human embryo. Prerequisite: Zoology 2 or the equivalent. Material fee, \$11.

152 Protozoa (3)**Mortensen**

Lecture (1 hour), laboratory (4 hours). 1961-62 and alternate years: spring—evening. Introduction to the protozoa: classification, life histories, and physiology, with special emphasis on free-living types. Prerequisite: Zoology 1. Material fee, \$8.

155 Parasitology (3)**Kates**

Lecture (1 hour), laboratory (4 hours). 1961-62 and alternate years: fall—evening. An introduction to the study of animal parasitology, with a survey of parasitic types from the protozoa through arthropods. Prerequisite: Zoology 1 or the equivalent. Material fee, \$11.

162 Insect Physiology (3)**Munson**

1961-62 and alternate years: spring—morning. Lectures and laboratory work on the physiology of insects. Admission by permission of the instructor. Material fee, \$11.

171-72 Special Problems (3-3)**The Staff**

Academic year—as arranged. Written approval of the instructor is required. Material fee, \$11 a semester.

199-200 Proseminar (3-3)**The Staff**

Academic year—morning and evening. Designed to correlate and supplement the work of Zoology majors.

THIRD GROUP**204 Seminar in Invertebrate Zoology (3)****Mortensen**

1962-63 and alternate years: spring—evening. A study of original publications on hormones of invertebrate animals.

214 Advanced Invertebrate Zoology (3)

Not offered 1961-62. Lectures and laboratory work on problems in invertebrate physiology. Prerequisite: Zoology 1 and 101-2 or the equivalent. Material fee, \$8.

247-48 Morphogenesis (3-3)**Hansen**

1962-63 and alternate years: academic year—evening. Lectures and class reports on experimental morphology. Prerequisite: Zoology 41-42 or the equivalent.

251 Seminar in Vertebrate Zoology (3)**Desmond**

1961-62 and alternate years: fall—evening.

295-96 Research (arr.)**The Staff**

Academic year—as arranged; summer 1961—Zoology 295 (3). Investigation of special problems.

299-300 Thesis (3-3)**The Staff**

Academic year—as arranged; summer 1961—Zoology 299 (3).

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THE UNIVERSITY RECORD

SUMMER TERM 1960

FALL AND SPRING SEMESTERS 1960-61

DEGREES CONFERRED

JUNIOR COLLEGE

ASSOCIATE IN ARTS

OCTOBER 22, 1960

Karl Henry Ackerman
Louis Charles Adamo
Edward Greenwood Alexander, Jr.
Alan Joseph Avery
James Dunnington Babb, Jr.
Claudia Annette Bailey
Robert James Barbieri
Melvin Aaron Baron
Hamilton Scott Beggs
Hugh Leonard Brennan
Patricia Anne Callaghan
Adrian Bernard Ciazza
Nelson Harry Coar, Jr.
Stephen Michael Cohn
Joan Hull Colbert
David Aaron Cole
Sue Hyde Dodge
Anthony Dold
Norman James Farquhar
Michael Meigs Feakins
William Hugh Fearer
Lillian Filipovitch
Bette Sue Ford
Henry Hugh Frain
Sherie Simon Gamberg
Cheryl Lee Green
Edward Thomas Green
Joan Elizabeth Grubbs
Arthur Paul Herrmann, Jr.
Rita Carol Hoffman
Ronald Edward Kalts
Kira Kalvik
Barbara May Kaplan
Bernard Zelik Karmel
Judith Schoenfeld Karpowski
(With distinction)
Patricia Clare Kerman
Penelope Maria Koines

Md. Janice Louise Larkins
D.C. Barry Bryant Leon
D.C. Susan Linko
Va. Ralph Isaac Lipman
Calif. Estelle Deborah Luber
Va. Hsueh-Ling Ma
Pa. Robert Childs Macdonald
D.C. Alice Jane Maguire
Va. Douglas Donald Mann
D.C. Diane Karen Marimow
Va. Kenneth Leigh McMahon
Va. Carol Lee Miller
Del. Cora Elizabeth Moore
D.C. Irene McManus Moore
D.C. Jay Leslie Morton
N.Y. Martha Louise Mueller
Va. Mary Angela Nau
Va. Charles Domenick Packan
Calif. Nancy Beth Pittle
Pa. Joyce Elaine Raum
Md. Robert John Risteen
D.C. Edward Baxter Rusin
D.C. Paul Albert Schamerhorn
D.C. Nancy Jean Schubauer
Del. Charles Milton Schwab, Jr.
Md. Barbara Anne Shank
Va. Stanley Sherrel Smith
Va. Esther Anne Snyder
Va. Mohamed Amine Soussane
Md. William Taft Stuart
Md. Harold Joel Tomlin
D.C. Lawrence Gregori Usiskin
D.C. Marvin Mitchell Waldman
Md. Charles Thomas Weaver
N.J. Kenneth Bruce Weiner
N.Y. Richard Steven Weissberg
Md. (With distinction)

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FEBRUARY 22, 1961

Quincy Adams, Jr.
Heather Honey Adler
Carol Landess Ames
Richard Stephen Arkow
Susan Phyllis Badger
Francis Hugh Bell
Donald Frank Berens
Donald Charles Borton
Gabrielle Frances Butler
Mary Elizabeth Cauffman
Michael John Clark
Preston Cole Clark
Ray Frederick Cordova
Charles Harry Crist
Susan Elise Cunningham
Grace Louise Doyle
Kenneth Lee Dwyer
James Richard Eblen
Alan Ezrin
William Der Fong
John Richard Franceschini
Alfred John Galiani
Martin Victor Geary
Daniel Yost Gilham
Bartley Brooks Gordon

D.C. John Henry Hann
N.Y. (With distinction)
Va. George Joseph Hannon, Jr.
N.Y. William Downey Hardy, Jr.
Va. Linda Heffler
Va. Michael Roy Herron
Ohio Anthony Paul Hertz
Va. Anne Glenn Hill
Va. Charles Michael Hoffman
D.C. Ann Hightower Hughes
Pa. Ann Patricia Jackson
Md. Frank Neer Jackson, Jr.
Md. Michael Hyle Jessup
D.C. Robert Alan Jones
Va. James Patrick Kacmarik
Va. Barry Irwin Kanter
D.C. Aija Biruta Karklins
Va. Ann Cameron Kellogg
Va. Bessie Rita Koubele
D.C. Joan Ann Kramer
D.C. Julianna Elizabeth Kukoy
D.C. George Madison Lady
D.C. Carol Elizabeth Lander
Va. Thomas Jerome Lawlor
Md. Samuel Harold Leviten
Pa. Walter John Ligenza
Va. Peter David Mechanick
Va. Elaine Kay Mickelson

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Rhoda Baynard Miller
(With distinction)
Dina Modiano
Jon Richard Moore
Martha Jean Moore
Stanley Irving Music
Howard Warfield Myers
Elizabeth Thurston Norton
Linda Kay O'Donnell
John William Greene Ogilvie, Jr.
Heoung Lock Oh
Leon Pensky
Michael Joseph Perper
Bettie Popovich
Rose Popovitch
Dennis Joseph Riley
Carolyn Kay Rowsey
Gilbert Wilfred Roy
Richard Vernon Runge
Helen Santos

N.C. Dorothy Mary Scavone
Va. Sandra Lee Sinus
N.Y. Allan Smith
Va. Elizabeth Machin Smith
Va. Louise Marie Spauls
D.C. Andrew Simeon Stancioff
D.C. George O. Stapleton
D.C. Martin Stryker
Va. Charles Wesley Swisher
N.Y. Dora Anne Thornton
Korea Robert Paul Wade
D.C. Thomas Arden Warden
D.C. Dieter Carl Wasshausen
D.C. Dorothy Minter Watson
D.C. Woodbury David Weimern
Md. Conrad Henry Weisert
Va. Billie Jean Wickman
Va. Valerie Edith Wright
Va. Victoria Scott Young
D.C. (With distinction)

JUNE 7, 1961

Ellen Ahr
Judith Altman
Philip Samuel Amsterdam
Michael B. Arkin
William Clifford Arnebeck
Alinda Ann Arthur
Robert Sidney Arthur
Carol Lee Baker
Clark Post Baker
Rachel Barman
Michael John Benton
Sandra Janet Bergman
Don Edward Bierman
Robert Guy Black
Aaron M. Blum
Sandra Boorstein
Sidney Frederick Bosen
Dona Larue Bothell
Helen Strickland Bothwell
(With distinction)
Lynn Stevens Bream
Joyce Crow Brown
Ray DuBois Brown
Stephen Clawson Brown
(With distinction)
Ronald Anthony Browning
Charles Robert Brun
Frank Joseph Buckley
Joan P. Bush
John North Byers
Carolyn Ruth Cabbage
Bruce Michael Cambosos
Carol Christina Carlson
Catherine Rawlings Carroll
Anita Louise Cary
Robert Louis Cate
William Paxson Chalfant III
Anne Marie Clark
Martin Paul Claussen, Jr.
Stanley Lee Cohen
Jody Lynn Combs
Joseph George Coniglio
Karin Johanna Connell
Marilee Ray Connerat
Theresa Mary Conroy
June M. Cook
Edith Dinneen Costas
Catherine M. Criddle
(With distinction)
Douglas Morgan Crupper, Jr.
Willard Arthur Culver
Francis Thomas Curtis, Jr.
Stanley Walter Dabrowski
Joyce May Davis
John Gordon Day
Anthony J. De Luca
Louis DeSimone
Stuart Harvey Dickman
Susan Barbara DiFilippo

R.I. Charlotte Katherine Diltz
Va. Dorothy Dimick
Robert E. Dix
N.J. John Hughes Donoghue II
Va. Richard William M. Douglas
Md. Emmett Charles Dye, Jr.
Va. Claude Wayne Elliott
Va. Sally Bradley Eley
W.Va. Edward George Englebart
D.C. Barbara Joy Englander
D.C. Barbara Zell Epstein
Va. Peter Laval Evers
D.C. Susan Gail Fabricant
D.C. Phyllis Virginia Fahrney
Fla. Barbara Lou Fallan
N.Y. Irwin Stuart Feldman
D.C. (With distinction)
D.C. Jon Alden Feldman
Va. Rita Joyce Ferrara
D.C. (With distinction)
D.C. Jean Teresa Ferrick
Va. Alpheus Edwin Forstman
N.J. (With distinction)
Md. Robert William Fox
John J. Freeman
John Stanley Freid
D.C. Greta P. Friedman
D.C. Thomas Barrett Gaines
Va. Philip Fox Gardner
D.C. (With distinction)
D.C. Phyllis Jeane Garnett
Tenn. John McHenry Garrison
D.C. Thelma Ann Gehringer
D.C. Carole Ann George
D.C. Martin J. Gersten
Va. Elaine Pearl Gertler
Md. Othan Opry Gilbert, Jr.
Md. Iris Rhona Ginsburg
Va. Sheila Rae Ginsburg
Md. Sharon Lee Glenn
D.C. Fred Burton Goldman
Pa. James Keith Graham
Va. William Allen Graham
Va. Fred Harvey Grant
Maine John Gregory
(With distinction)
Va. William Taliaferro Grier
D.C. Philip Gross
D.C. (With distinction)
D.C. Andrew Anthony Guida
D.C. Leonard Benjamin Gunsior
D.C. Thomas A. Guterman
D.C. Nancy Jane Haines
Mass. Linda Jo Hama
Md. Mollie Ann Harper
Wis. (With distinction)
Pa. Caroline T. Hauptmann
Pa. Edith M. Heflin
Md. Sidney R. Henderson
N.Y. Daniel L. Hine, Jr.

N.J.
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|--------------------------------|--------|--------------------------------|------------|
| Richard Allan Hirsch | Fla. | Darryl Dennis Rekemeyer | Md. |
| Barbara B. Ho | D.C. | Stanley Ray Remsberg | Kans. |
| Sandra Mae Homlar | Fla. | (With distinction) | |
| Barbara Lillian Hor | D.C. | Jeremy William Reynolds | Va. |
| Charles William Hornfeck | Pa. | Ralson Raymond Rhodes | W. Va. |
| Richard J. Hornfeck | Pa. | Eleanor Sue Richman | D.C. |
| Elizabeth Anne Hoska | Va. | Sharon Ann Ringel | D.C. |
| Leslie Allan Hubbard | Va. | (With distinction) | |
| Carol H. Isaacs | N.Y. | Suzanne Darimont Ritter | D.C. |
| Billie Faby Jackson | D.C. | Juliane Robins | Va. |
| (With distinction) | | Girard Hayden Rodgers, Jr. | D.C. |
| Thomas Avery Jackson, Jr. | Va. | Thomas Norman Reed Rogers | D.C. |
| Basil Louis Kalandros | D.C. | Joel L. Rosenthal | Md. |
| Shailaja S. Kalelkar | India | Stuart Philip Ross | Va. |
| Blanche Hyatt Keller | D.C. | Sara Rovner | Pa. |
| John Logan Kempfe | Oreg. | Robert F. Ruhl | Md. |
| Maxine Fillyaw Kendrick | Va. | Patricia Ellen Messner Sayles | Va. |
| Gary Woodward Kern | D.C. | Susan Scher | N.Y. |
| Evelyn S. Kerper | D.C. | James H. Scherff | Va. |
| William Clayton Keys | Md. | Courtney Dorian Schlosser | Md. |
| Helen Ruth Kidd | D.C. | Elizabeth Beale Schwartzmann | D.C. |
| Jim Rush Killelte | Va. | Sandra Joan Servator | D.C. |
| Marjorie Ellen Killian | Va. | Mark Franklen Sherry | D.C. |
| Thomas Hare Kilpatrick | D.C. | James Alan Shneer | Va. |
| Gertrude King | Va. | Thomas Hakes Shrover | Md. |
| Marc Alden Klaben | D.C. | Linda Gayle Silverberg | D.C. |
| Christine Wilson Knudson | D.C. | Marlene Merle Silverman | D.C. |
| Hedwig Klara Helene Koehler | D.C. | Juris Simanis | Md. |
| Frederick Joseph Kraus | Md. | Gilda Simon | D.C. |
| Margaret Lydia Kroll | D.C. | Meryl Sue Simon | N.J. |
| William Rochelle Kupersmith | D.C. | Robert Franklin Sisson, Jr. | Va. |
| William Cornelius Lambert, Jr. | D.C. | Wayne Nelson Smallwood | D.C. |
| Ronald Wilson Langston | Va. | James Edward Sniegocki | Va. |
| Barbara Dolores Lanxon | N.J. | Merlyn Michael Soukup | Md. |
| Kenneth Rounds Larish | D.C. | (With distinction) | |
| Robert Leonard Lavine | Md. | Daniel Earl Spector | Tenn. |
| (With distinction) | | Nicholas E. Spyropoulos | D.C. |
| Leo Merrill Laymon | W. Va. | Eugene Paul Stakem | Md. |
| Alexander Leeds | D.C. | Alice A. Stepanian | Iran |
| Ian Jay Levy | N.Y. | F. Delano Stewart | D.C. |
| David Flick Logan | Ohio | Linda Kay Stone | Colo. |
| Michael T. Madison | D.C. | Sally Clark Stone | Va. |
| (With distinction) | | Geraldine Marie Sullivan | D.C. |
| Leonard Jan Malamud | D.C. | Carolyn Lorain Sundberg | N.J. |
| Betty Lynn Malnassy | Va. | Freda Ruth Sussman | D.C. |
| Marjorie Helen Martin | Va. | Elaine Paula Tanenbaum | D.C. |
| Emma Jane Martinchek | Va. | (With distinction) | |
| Fred Carver Mather | Va. | Mickey Neil Taylor | Oreg. |
| Donna Lee May | Va. | Ernest A. Thomas, Jr. | D.C. |
| Marjorie Lynn McChesney | Va. | Fitzhugh Thomas | Va. |
| Marc Elie McClure | D.C. | Ann W. Thompson | Va. |
| Nancy Mae McDonald | D.C. | Marcia Elizabeth Thompson | D.C. |
| Bertel Robert McGill | D.C. | Robert O'Neil Thompson | D.C. |
| Dorothy Alvina Meissner | D.C. | William Prescott Townshend | D.C. |
| Karen Linda Mercado | D.C. | Lyne Transtrum | Del. |
| Paul Joseph Munley | Pa. | Gail R. Trebow | D.C. |
| Elisa Tara Myers | N.Y. | Edward William Tupling | Columbia |
| Jacquelyn Lee Norton | Va. | Jorge Alberto Uribe | Va. |
| Koichi Nukaga | Japan | Beverly Virginia Vail | Va. |
| Linda Carol Nusbaum | Md. | Frederick Plitt Vaughn | D.C. |
| (With distinction) | | Carole Ann Vereka | N.Y. |
| Carol Ann Nyquist | Va. | Walter VanWely Vink | D.C. |
| Richard Ernest Oden | D.C. | Janice Sandra Wald | Va. |
| Allan David Okin | D.C. | Howard Stuart Walker | D.C. |
| Ellen Rae Olefsky | D.C. | Raymond Francis Walker | D.C. |
| Lawrence Stuart Oliver | Md. | (With distinction) | |
| David Allen Pannebecker | D.C. | Anderson Wallace, Jr. | Va. |
| John Alford Parker, Jr. | D.C. | Judith Wallington | D.C. |
| William Thomas Pashe | N.J. | Eng C. Wang | D.C. |
| Stephanie Carol Patchen | D.C. | Ronald Wartow | Md. |
| (With distinction) | | Beth Sheva Weyman | D.C. |
| Frank Benjamin Pazzaglia | Pa. | John Alton White | Md. |
| Pamela Jean Peter | Md. | Elizabeth Louise Whitely | Va. |
| Iva Petrossian | Iran | Olivia Jess Winstead | Canal Zone |
| Zara L. Eagle Pippitt | D.C. | Archibald Mulford Woodruff III | Va. |
| Phillip Jefferson Place | D.C. | (With distinction) | |
| Patricia Ann Pumpfhey | D.C. | Howard Sanford Yager | D.C. |
| Charles C. Putney, Jr. | D.C. | Stanford Stoker Yates | Utah |
| John Paul Ransom, Jr. | Calif. | Allan Eric Yockelson | D.C. |
| Wanda Helene Rappaport | Conn. | Melinda Lee Young | D.C. |
| (With distinction) | Va. | (With distinction) | |
| Larry Marvin Raskin | Va. | | |

ASSOCIATE IN SCIENCE

JUNE 7, 1961

Marcella Clea English

Va.

COLUMBIAN COLLEGE

BACHELOR OF ARTS

OCTOBER 22, 1960

Harold Theodore Bergem
Anita Jane Brinckmann
Barbara Keesee Callaway
Stephen Edward Chase
Sam Shaw Crutchfield, Jr.
Deana Arlene McDonald Ericksson
Margaret Helen Farkas
Thomas Walsh Farquhar
Gerald Arthur Fitzgerald
Paul Evan Friedenberg
Sally Schubauer Gassaway
Patricia Elizabeth Gustin
Gregory Newton Harney
George Albert Hawks
Irwin Hecker
F. Dixon Hickman, Jr.
Melvin Dale Hooper
Judith Ann Jaudon
Joseph Kent Jolley
Burton Harvey Kaplan
Nadya Austina Kayaloff
Barbara Knopf Kline
Gertrude London

Wash. Aubrey Jackson Lynn, Jr.
Va. Eugene Marseglia
Va. (Special honors in Art History and
Md. Theory)
D.C. Janet Ann Martin
D.C. Claire Sklaroff Marwick
Va. Lawrence Frank Mihlon
D.C. Edward Patrick Murray
D.C. Francis Alan Parsons
D.C. John Seward Phillips
Md. James Henri Poythress
D.C. Rolando Quiogue
Va. Karen Lani Schlageter
Miss. Arlo Allen Schultz
Canada Pearl Wolkinson Schwartz
D.C. Richard Edward Slavin III
Va. Gail Gertrude Evertsen Smith
Va. William Edward Smythe
Idaho Vilia Vocezar
Mass. Wallace Hartman Weiss
D.C. Ann Wentworth
Va. Bryan McCaslin Williams
D.C. Sharon Ann Wilson

Va.
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Ind.
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W.Va.
Va.
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D.C.
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Ind.

FEBRUARY 22, 1961

David Ernest Aaronson
(With distinction)
Charles Michael Alvarez
Jack Allen Arthur
Marvin Roy Bader
Marcia Barrett
(With distinction—Special honors
in Art History and Theory)
Atwood Sinclair Barwick
Phyllis Begelman
Richard Frederick Bradberry
(With distinction)
Sandra Elizabeth Bregman
Franklin William Brownstein
Hana Bruml
Raymond Allen Carrington
Patricia Jane Castell
Dorothy Cottrell Caswell
Caroline Raines Cohen
Gayle Frances Cook
Catherine Breese Davis
Elizabeth Beasley Del Donna
LeRoy Norman DeBrow
Harry Robert Fenstad
Ellen Geiger
Bertha Florence Harris
Ida Helbig
Sally Ann Herrington
Joanne Elsie Holler
John Jefferson Hudgins
Stephen Daniel Keeffe
Dietrich Harvey Kirkell
Anne Marie Kirschenbaum
(With distinction)
Linda Gerber Klein
(With distinction)
Aaron Ira Knott

D.C. Elisabeth Denby Lewis
D.C. Lois Frances Limbert
Va. Jonathan Asmel Lindsey
Va. Fanita Lytle Martin
Va. Robert Cecil McCandless
D.C. Joseph Martin McCandless
Md. Roland Edward McDaniel
D.C. Thomas Joseph McDonald
Md. Kathleen Adair Michelson
Texas David Mogenssen
Henrietta Simpers Moore
Va. Joan Mark Neary
R.I. Alan Julian Newman
Va. Paula Frances Pascal
Md. Patricia Ann Pfeiffer
Md. Arthur Schnoll Pomerantz
Ohio Gloria Ruth Rimens
D.C. Franklin Rios
D.C. Anne Carter Robins
D.C. Sara Rodriguez-Amorós
Va. Elizabeth Ruiz
D.C. Eileen Mary Scott
N.J. (With distinction—Special honors
Va. in English Literature)
D.C. Joe Max Smith
D.C. (With distinction)
D.C. Esther Anne Snyder
D.C. Gregory Michael Sullivan
Md. Thomas Francis Talentino
Va. Ronald William Thorntenson
D.C. William Wyatt Traak
Ohio Richard James Vipond
D.C. Carl Allen Wasbenko
Md. Joyce Baggett Williams
Md. Richard Martin Wilson
N.Y. John Stanton Woodson
Mary Jill Zell

Va.
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N.J.
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Iowa
Md.
Va.
Md.
D.C.
Ohio

Charles William Alicks
David Lyndle Ames

JUNE 7, 1961

N.J. Stanley Archenhold
Va. Terese Carole Aronoff

Md.
D.C.

| | | | |
|--|---------|---|-------|
| Warren DeLaplane Ashby, Jr. (Special honors in Germanic Languages and Literatures) | D.C. | Stuart Lee Kaplan | D.C. |
| Susan Hendricks Barbee | Va. | Sociye Karacalarli | D.C. |
| Caroline Theresa Barco | Belgium | Bernard Zelik Karmel | Md. |
| John Peter Barnes III | Md. | Martin Bernard Kass | D.C. |
| Lynne Moffat Barnes | Va. | Charles David Keilin | D.C. |
| Leonora Rocca Bernheisel | D.C. | (Special honors in Chemistry) | Va. |
| June Elaine Bisell | Va. | James Pierre Goulet Kenyon | Mo. |
| Nancy Brewer Blackall | Mass. | Marilyn Jeanette Kincaid | D.C. |
| Jane Bollman Blair | Pa. | Marcia Suzanne Kirsch | D.C. |
| John William Boettjer | Ind. | Florence Edith Knight | Md. |
| (With distinction—Special honors in History) | | Jerome Dean Krohnfeldt | Texas |
| James Edward Bradley | Md. | Evelyn Powell Lakes | Md. |
| Martina Perry Britton | N.Y. | Earl Kaufman Landau | D.C. |
| Barbara Ann Brown | Md. | George Lee | D.C. |
| (With distinction) | | John Cornelius Koons Lewis | D.C. |
| Karl Marx Burtram | Ala. | Susan Ariel Libbin | Md. |
| Catharine De Witt Cabell | D.C. | Stewart Wentworth Macdonald | R.I. |
| Clare Elizabeth Calvert | Va. | Evans John Mandes | D.C. |
| Alvin Capp | Fla. | Dona Burnett Hamburger Marler | Va. |
| Mary Devereux Carter | D.C. | Dorothy Katherine Marshall | Md. |
| Ellen Frances Cassidy | Md. | (With distinction—Special honors in French Language and Literature) | Ohio |
| Donald Joseph Cavanaugh | R.I. | John Douglas Martin | D.C. |
| John Charles Chatel | D.C. | Herbert Maurice Maurer | Va. |
| Rosalind Harriet Chernoff | Ill. | Marjorie Lorene Maxson | Md. |
| Norma Engberg Church | Va. | Charles Andrew Mavi | D.C. |
| Sandra Jean Clements | Md. | Francis Raymond McGlynn | D.C. |
| (Special honors in History) | | Harry Newlin McGill, Jr. | Conn. |
| Peter Glenn Allen Clouse | Va. | John Michael Metelsky | Md. |
| Virginia Sweet Cobb | D.C. | Nancy Carolyn Mitchell | D.C. |
| Routh Nash Coffman | Va. | Alan Frederick Montross | D.C. |
| (With distinction) | | Mary Beth Moscattello | D.C. |
| Elaine Barbara Cohen | D.C. | David Michael Moss | D.C. |
| Stephen Michael Cohn | D.C. | (With distinction) | |
| Veronica May Collins | Va. | John Stewart Murphy | D.C. |
| Marcia Elaine Coppel | D.C. | Elie Negrine | Md. |
| Gerald Anthony Cosco | N.Y. | Lynn Ockerman | Va. |
| Ann Costakis | D.C. | Elaine Mary Pastis | D.C. |
| Kathleen Calhoun Crouch | D.C. | Charles Sherman Perry | Va. |
| Elizabeth Ketchum Debevoise | Va. | Edith Caylor Petersilia | Va. |
| Russell Joseph DeStephano | Pa. | (With distinction) | Va. |
| Robert Edward Dimond | Md. | Elsie Mandis Petty | W.Va. |
| Robert Ellwood Dix | Va. | Sanford Norman Plevin | D.C. |
| Barbara Joan Dunham | Va. | John Andrew Prokop, Jr. | D.C. |
| Gwendolyn Greger Edsall | Md. | Elizabeth Graham Radue | Maine |
| James Dunham Fairweather | Va. | Cynthia Mason Rhodes | Va. |
| Gloria Margaret Farkas | N.J. | Elaine Esther Rosenthal | |
| William Joseph Ferris, Jr. | D.C. | (With distinction—Special honors in Spanish Language and Literature) | Ind. |
| Nicholas Andrew Fidandis | Va. | Katherine Struck Rossi | Va. |
| Lois Beverly Fout | Va. | Mary Trent Scott | Va. |
| Susan Elizabeth Gadsby | Mass. | Carole Mae Scruggs | Va. |
| Edith Eleanor Gaines | N.Y. | Arthur Garfield Shaffer | D.C. |
| Mary Stuart Gaskill | D.C. | Lawrence Hugh Shaw | |
| (With distinction) | | (With distinction) | D.C. |
| Thomas Herbert Gatewood, Jr. | Ga. | Joan Libby Shinberg | Va. |
| Daniel Yost Gilham | Va. | Catherine Jeanne Simon | N.Y. |
| Janet Beth Ginberg | D.C. | Margaret Louise Skogen | Md. |
| Michael Lance Glaser | D.C. | Harry Lancaster Slye III | D.C. |
| Edgar Clifton Good, Jr. | Va. | Corinne Tietjens Sommer | D.C. |
| Alice Naomi Goodman | Va. | Herbert Alan Spark | Md. |
| Richard Lewis Gowell | Va. | Michael Bart Spevak | |
| Nancy Louise Grayson | D.C. | (With distinction) | W.Va. |
| Edward Thomas Green | Pa. | Cecil Everett Spurlock | D.C. |
| Robert Patrick Green | Md. | (Special honors in History) | Va. |
| Bruce Alden Greene, Jr. | D.C. | Mandell Don Stearnman | Va. |
| Robert Edward Greenstein | N.J. | Charles Dinwiddie Stores, Jr. | Md. |
| Edwin Neil Gross | N.J. | La Rue Thomson Strieby | Md. |
| William Charles Halter, Jr. | N.Y. | Roger Winship Stuart II | Md. |
| Carol Elizabeth Hanks | D.C. | William Taft Stuart | |
| Nancy Jean Hanks | Texas | (With distinction) | Va. |
| Ellen Suzanne Harris | D.C. | Neil Francis Stull, Jr. | Md. |
| Nancy Lee Head | D.C. | Edward Thomas Sutherland | |
| (Special honors in Religion) | | (With distinction) | Va. |
| David Eugene Herndon | D.C. | Willis Harrison Truitt | Pa. |
| Jean Margaret Howarth | N.C. | Robert Lewis Van Blois | Va. |
| William Harry Huffman | Md. | Robert Harrison Van Meter | D.C. |
| Donna Paige Immen | Tenn. | Mary Doris Ver Hage | N.J. |
| Carol Vine Itchner | Va. | John Henry Vogt, Jr. | Va. |
| Adelaide Priscilla Itsoitz | D.C. | Bettie Sue Wagstaff | Va. |
| (With distinction) | | Annabelle Hoppe Walker | D.C. |
| Denis Andre Jacques | Va. | Jane Angela Walsh | D.C. |
| Edith Becker Jones | Mo. | Evalyn Lee Weedon | D.C. |

Eileen Jo Weppner
(Special honors in English)
Harvey Robert Wertlieb
James Samuel Whitehead
Glendon Donnell Willey II

D.C. Miriam Judith Wondrack
Md. Sally Gerdes Wray
N.C. (With distinction)
Va. Melinda Ann Young

D.C.
Va.
N.J.

BACHELOR OF SCIENCE

OCTOBER 22, 1960

Laurence Mathews Bryson
Mary Lee Chatrnuck
Philip Louis Dobák
Joan Ramage Mitchell

Va. Hugh McClelland Pettigrew
W.Va. Jasper Warner Rothuizen
D.C. Raymond Michael Shirven
Md.

D.C.
Holland
D.C.

FEBRUARY 22, 1961

Andrew Morrison Findlay

D.C. Philip Wade McClain

D.C.

JUNE 7, 1961

Bernard Ralph Aserkoff
Elizabeth Corinne Bailey
(With distinction—Special honors
in Chemistry)
Martin Isaac Bertman
John David Clough
(With distinction—Special honors
in Zoology)
Edward Der-Martirosian
Brenda Cecile Flam
Toni S. Garlan
Patricia Dee Gillam
Elliot Robert Goldstein
David Preston Grimes
Ernest Hilsenrath

Md. Joseph Ellsworth Himes
Md. (With distinction)
Barbara Lou Johnson
Norman Stuart Kowalsky
Stuart Alan Levinson
N.J. Barry Emmanuel Nash
Md. Richard Kelly Oliver
(With distinction)
D.C. Robert Winters Rhodes
Del. Dirgham Salahi
Va. Steven Carl Sandler
Va. William Albert Schmidt
D.C. William Ronald Teter
Va. Arthur Richard Ugel
D.C. Willis Boly Wheeler

D.C.
Md.
N.J.
Va.
N.Y.
D.C.
Md.
Jordan
D.C.
D.C.
D.C.
Va.

BACHELOR OF SCIENCE IN MEDICAL TECHNOLOGY

OCTOBER 22, 1960

Janet Ann Glenn

D.C. Carolyn Portnoy

D.C.

MASTER OF ARTS

OCTOBER 22, 1960

Merrill David Clayson
B.S. 1956, University of Utah
Joy Rochelle Gold
A.B. 1958, The George Washington
University
Odessa Milford Hahn
A.B. 1927, Randolph-Macon Woman's
College
Richard Earl Hilligos
A.B. 1949, University of Akron
Stephen Ralph Judge
A.B. 1937, The George Washington
University
Kathryn Theresa Louka
A.B. 1957, The George Washington
University
Sandra Nelson
A.B. 1956, Lebanon Valley College
Thomas Hale Pendleton
A.B. 1937, B.S. 1959, West Virginia
University
Barbara Joan Powell
A.B. 1957, Washington University

Utah Kathleen Marie Schaub
B.S. 1955, University of Illinois
Md. Elias Naudain Simons III
A.B. 1955, Washington and Lee
University
Md. Frederic Newcomb Smith
A.B. 1958, The George Washington
University
Va. Donald Edward James Stewart
A.B. 1953, Washington and Lee
University
N.Y. Elizabeth Laura Stirling
A.B. 1958, The George Washington
University
D.C. Victor Reuben Swenson
A.B. 1958, Oberlin College
N.J. Nora Pauline Topalian
A.B. 1949, University of Maryland
W.Va. Regis Hill Walther
A.B. 1941, University of California
at Los Angeles

Ill.
D.C.
Ind.
Pa.
D.C.
Ind.
D.C.
Va.

FEBRUARY 22, 1961

Nancy Murphy Adams
A.B. 1957, American University
Walter Eggert Beach
A.B. 1956, Dickinson College

D.C. Eric Winston Beshers
D.C. A.B. 1958, Harvard University

Md.

Degrees Conferred

333

| | | | |
|--|-------|---|-------------|
| Frederick William Blass A.B. 1932, University of Pennsylvania Th.B. 1935, Philadelphia Divinity School | D.C. | Joan Frances Manor A.B. in B.A. 1957, College of William and Mary | D.C. |
| Robert Bell Bradley B.S. 1948, University of Maryland | Md. | Josephine Marie Meers A.B. 1956, The George Washington University | Ind. |
| Sara Frances Bagdon A.B. 1944, Baylor University | Texas | Paulo Adolfo Spargnapani A.B. 1958, The George Washington University | Switzerland |
| Arthur Russell Burnett A.B. 1932, Oberlin College | N.Y. | Irving Charles Stone, Jr. B.S. 1952, Iowa State College of Agriculture and Mechanic Arts | Va. |
| Diane Franks Ely A.B. 1953, The George Washington University | D.C. | James Lawrence Tennant A.B. 1957, Albion College | Mich. |
| Carl Edwin Fritz, Jr. A.B. 1952, Hiram College | Del. | Christine Edda Verdross A.B. in Ed. 1958, The George Washington University | Va. |
| Gerald Harris Goldberg A.B. 1956, University of Connecticut | Conn. | Arthur Stergios Zamanakos A.B. 1950, Boston University | Va. |
| Virginia Vogt Johnson A.B. 1941, Knox College | Va. | | |
| Barbara Brant Knight A.B. 1959, College of William and Mary | D.C. | | |
| James Patrick Lamb A.B. 1956, Catholic University of America | Va. | | |

JUNE 7, 1961

| | | | |
|---|-------|---|--------|
| Arren Aylalian A.B. 1958, The George Washington University | D.C. | Joseph Edward Keilin A.B. 1958, The George Washington University | D.C. |
| Helen Sagmaster Barr A.B. 1958, Bryn Mawr College | Ohio | Fred Cornelius Latham A.B. (C.G.S.) 1959, The George Washington University | Ill. |
| Henry Wotte Bigelow B.S. 1930, Tufts University | Md. | Muriel Janet Lewis A.B. 1944, University of California | Calif. |
| Adam Bilecky B.S. in B.A. 1955, Ohio State University | D.C. | A.M. 1952, New York University | |
| Bessie Eileen Buxton A.B. 1954, Kent State University | Va. | Robert Franklin Marler, Jr. B.S.E. 1954, Princeton University | Va. |
| George Foster Daniels A.B. 1954, Washington College | Va. | John Paul Methvin A.B. 1960, The George Washington University | D.C. |
| Jeanne Marie Davis A.B. 1951, The George Washington University | Md. | Ruth Zollinger Miller A.B. 1957, The George Washington University | Md. |
| William Alfred Draper B.S. in Ed. 1935, D.C. Teachers College | Md. | Paul Ira Raines A.B. 1958, The George Washington University | D.C. |
| Eleanor Theresa Fay A.B. 1957, The George Washington University | Va. | Lois Compton Richards A.B. 1958, The George Washington University | Va. |
| Margaret Virginia Hastings B.S. in B.A. 1954, West Virginia University | W.Va. | Judith Anne Segal A.B. in Govt. 1957, The George Washington University | Va. |
| Elizabeth Anne Hemphill B.F.A. 1941, University of Nebraska | Nebr. | Walter James Stuart, Jr. A.B. 1955, The George Washington University | D.C. |
| Maizie Harrison Johnson Ed.B. 1938, Teachers College of Connecticut, | Va. | Vito Tanzi A.B. 1959, The George Washington University | D.C. |
| Thomas Page Johnson A.B. 1957, The George Washington University | | | |

MASTER OF SCIENCE

OCTOBER 22, 1960

| | | | |
|--|------|--|-------|
| Phillip Dayle Baldauf B.S. 1956, Principia College | Va. | Gloria Mae Hammack B.S. 1958, The George Washington University | D.C. |
| Hugh James Bartley B.S. 1947, U.S. Military Academy | Va. | Hsien Hsiang Ku B.S. in C.E. 1940, M.S.E. 1941, Purdue University | D.C. |
| Gilbert Alex Diaz B.S. 1951, Michigan State University of Agriculture and Applied Science | D.C. | George I. Malinin B.S. 1958, Concord College | W.Va. |
| William Bernard Gordon B.S. 1950, The George Washington University | D.C. | Alan Donald Mighell B.S. 1957, The George Washington University | Md. |
| | | John George Wangler, Jr. B.S. 1959, American University | Va. |

FEBRUARY 22, 1961

| | | | |
|---|-----|--|--------|
| David Clark Burdge B.S. 1958, The George Washington University | Va. | Damianos Evangelos Karandreas A.B. 1956, Mississippi Southern College | Greece |
|---|-----|--|--------|

John Eric Lindsold
B.S. 1956, University of Illinois
William Bruce Matthews, Jr.
B.S. 1953, University of Maryland

Ill. Leonard Wartofsky
D.C. B.S. 1959, The George Washington University

D.C.

JUNE 7, 1961

Carmia Ganz Borek
B.S. 1959, American University
Alicelia Hoskins Franklin
B.S. 1938, Tufts University
Joseph Benton High
B.S. 1954, The George Washington University
Jack Markowitz
B.S. 1955, Ohio State University
William Marshall McKeeman
A.B. 1956, University of California
Kittie Anne Murray
A.B. 1958, The George Washington University
James Herbert O'Mara
B.S. 1957, The George Washington University
Henry Clayton Orr
B.S. 1949, Howard University

Md. Paul Jay Price
D.C. B.S. 1959, University of Maryland
Harvey Richard Schiffman
D.C. A.B. 1957, The George Washington University
George Myron Sheldon
Md. A.B. 1952, College of Idaho
Cecilia Watkins Spearing
Calif. A.B. 1947, Hunter College
A.M. 1949, Columbia University
Herbert Eli Spiegel
Wis. B.S. 1956, Brooklyn College
Alexander Glatstein Stone
Va. Doctor of Laws 1940, University of Debrecen, Hungary
Edward James Walsh
D.C. B.S. 1958, University of Notre Dame

Md.

D.C.

Calif.

N.Y.

Md.

Md.

Md.

THE SCHOOL OF MEDICINE

DOCTOR OF MEDICINE

JUNE 7, 1961

Mahmmed Akbarian
A.B. 1957, The George Washington University
Burton Norman Alter
B.S. 1958, Yale University
Robert Lee Altman
B.S. 1957, Westminster College
Arthur James Anderson
Scott Wayne Ankeny
A.B. 1954, The George Washington University
Lucy Denise Antoniou
A.B. 1958, The George Washington University
Roger Morris Atwood
A.B. 1957, Carleton College
Howard Samuel Baer
A.B. 1957, Wesleyan University
Robert Miller Barnhart
Mason Barr, Jr.
A.B. 1957, Haverford College
John Albert Beeman
A.B. 1958, Occidental College
Dale Roger Bertuch
Delano Woodrow Bolter
Violet Ella Bowen
A.B. 1958, The George Washington University
Robert Camio Calvo
B.S. 1956, Rutgers University
Constance Joan Campbell
A.B. 1958, The George Washington University
Clyde Frank Chambers, Jr.
John Peter Clay
A.B. 1956, Occidental College
Allan Barry Cohan
A.B. 1957, The George Washington University
Thomas Grosvenor Colmey
A.B. 1957, Duke University
Justin Lyle Conrad
A.B. 1957, Northwestern University
Jack Phillip Covell
Irvin Jack Cowley
Francis Gene Dahlke
Jack Tom Dancer
B.S. 1957, University of Arizona

Iran Paul Roger DeMordaunt
Robert Arthur Derro
Va. A.B. 1957, Harvard University
Vincent Theodore DeVita, Jr.
Md. (With distinction)
B.S. 1957, College of William and Mary
John Albert Dolan
D.C. B.S. 1957, Georgetown University
Ronald Edward Dunn
Md. B.S. 1957, University of Idaho
Peter Alan Fleming
D.C. A.B. 1956, San Diego State College
Morton George Fried
(With distinction)
A.B. 1957, New York University
Minn. Milton Gallant
Conn. A.B. 1957, Rutgers University
Ray Fillmore Garman
Md. A.B. 1957, Johns Hopkins University
D.C. Francis Kenneth Gates, Jr.
A.B. 1956, Occidental College
Calif. Henry Smither Gering
B.S. 1957, The Citadel
Va. Andrew Manuel Giovannini
Calif. A.B. 1957, University of California
W. Va. Ronald Milton Graham
Thomas Hamlin Gresinger
N.J. A.B. 1957, Williams College
Carl Richard Guiton
Va. A.B. 1957, Columbia University
Clayton Allan Hixson
B.S. 1957, Fairmont State College
William Francis Hogan
Md. A.B. 1958, The George Washington University
Calif. Kin Lincon Hung
D.C. B.S. 1957, University of Maryland
William Clymer James
A.B. 1954, Harvard University
Ill. John Howard Jennings
A.B. 1957, Central College
N.D. Bruce McCoy Johnson
A.B. 1957, Carleton College
Ind. Robert Katz
Utah Barry Melvyn Kaufman
Wis. B.S. 1958, University of Wisconsin
Ariz. Frank Jay Keefer
A.B. 1957, Washington and Jefferson College

Idaho

Mass.

N.Y.

Md.

Idaho

Calif.

N.Y.

N.J.

Va.

Calif.

D.C.

Calif.

Wash.

D.C.

N.J.

D.C.

Va.

D.C.

D.C.

Me.

Ohio

D.C.

N.Y.

W.Va.

| | | | |
|--|---------------------|--|-------------|
| Robert John Kelly A.B. 1958, University of Missouri | Va. | Lynn Brockbank Rowe | Utah |
| Lois Estelle Knapp B.S. 1958, Gustavus Adolphus College | D.C. | Robert Scott Schull (With distinction) A.B. 1957, Tulane University | N.Y. |
| Norman John Knorr | Md. | Wilbur Lowell Secrist | W.Va. |
| Ronald Gordon Latimer A.B. 1958, The George Washington University | D.C. | A.B. 1957, West Virginia University | Va. |
| George Lamoyne Lucas A.B. 1957, Ohio University | Ohio | Robert Morris Senior (With distinction) A.B. 1957, Oberlin College | |
| Margaret Mary Maggio | N.J. | Leon Gilbert Sheer | Md. |
| Robert Powell Majors, Jr. B.S. 1957, Davidson College | N.C. | A.B. 1958, The George Washington University | |
| John Lloyd Marlow B.S. 1957, Brigham Young University | Idaho | William Hart Sheffield A.B. 1957, Yale University | Calif. |
| James Kent Mason A.B. 1959, Montana State University | Va. | William Charles Silberman A.B. 1958, The George Washington University | Va. |
| Jacob Lenhardt Mathis, Jr. A.B. 1957, University of California | Calif. | Hossein Chaharbashi Sobhani B.S. 1957, University of Oklahoma | Iran |
| Samuel Frank Mazella A.B. 1957, Cornell University | N.J. | Peggy Ann Stubbs A.B. 1958, The George Washington University | Va. |
| Francis Donald McGuire A.B. 1957, New York University | N.J. | Harry Randolph Tate A.B. 1957, University of Virginia | Va. |
| Donald McKay (With distinction) A.B. 1955, Harvard University | Mass. | Richard Luman Tenny A.B. 1957, Duke University | N.C. |
| Jay Howard Miller, Jr. B.S. 1957, The George Washington University | Md. | William Frederick Thompson B.S. 1957, The George Washington University | Md. |
| Valery Thornton Miller A.B. 1958, The George Washington University | D.C. | Donald Julius Tucker A.B. 1957, Cornell University | Va. |
| Allen Mendel Mondzac (With distinction) A.B. 1958, The George Washington University | Md. | Peter Arthur Tverman A.B. 1957, University of Oregon | D.C. |
| James Reardon Moore, Jr. B.S. 1957, The George Washington University | Md. | Francis Xavier Urbanski B.S. 1957, Dickinson College | N.J. |
| Thomas Edison Morledge B.S. 1955, University of Arizona | Mont. | William Vernon Van Fleet (With distinction) A.B. 1957, A.M. 1959, The George Washington University | D.C. |
| Charles Nemeth Donald Owen Nutter A.B. 1957, Johns Hopkins University | Va. D.C. | Hau Neoc Vu Arthur Andrew Wallman B.S. 1957, Queens College | N.Y. Md. |
| Charles Burton Radlauer Fernando Enrique Ramirez A.B. 1958, The George Washington University | N.Y. Puerto Rico | Florent Franklin Westfall, Jr. (With distinction) A.B. 1958, West Virginia University | |
| Richard Curtis Rehmeyer A.B. 1957, Haverford College | Md. | Daniel Britton White A.B. 1957, Dartmouth College | Mich. |
| Robert Daniel Rosenberg | N.Y. | Warren Arthur Wood, Jr. B.S. 1957, Hillsdale College | Va. |
| | | Gary Warren Zelles A.B. 1957, Rutgers University | N.J. |

THE LAW SCHOOL

BACHELOR OF LAWS

OCTOBER 22, 1960

| | | | |
|---|------|---|------|
| Carl Theodore Bodolus A.B. in Govt. 1954, The George Washington University | Fa. | Robert Scott Cullen A.B. 1954, Washington and Lee University | Va. |
| Lester Junod Boykin A.B. 1946, Duke University | D.C. | Julian Falk B.S. 1957, Pennsylvania State University | Pa. |
| B.S. 1950, U.S. Merchant Marine Academy | | Thomas William Fletcher A.B. 1951, College of Wooster | Va. |
| Darrell Gene Brekke B.S. in E.E. 1954, South Dakota School of Mines and Technology | S.D. | Arthur Freilich B.C.E. 1956, Rensselaer Polytechnic Institute | Va. |
| James Ignatius Burkhardt B.S. 1956, Pennsylvania State University | Pa. | Melvin Gerald Goodweather A.B. 1951, University of North Carolina | Ohio |
| Lawton Arthur Burrows, Jr. B.Chem.E. 1957, University of Delaware | Va. | David Wayne Griffin A.B. 1956, Catawba College | Va. |
| William Charles Cahill B.E.E. 1955, B.M.E. 1956, University of Akron | Va. | James John Hamill B.M.E. 1957, Georgia Institute of Technology | Va. |
| Ronald Sander Cornell B.S. 1956, Queens College | Va. | James Anthony Holtzer A.B. in Govt. 1957, The George Washington University | Pa. |
| Carlton Rhule Croyle B.M.E. 1956, Clarkson College of Technology | Va. | Florian Harley Jabas B.S. 1957, University of Wisconsin | Wis. |

| | | | |
|--|-------|---|-------|
| Bruce Anderson Jagger B.S. in Chem.E. 1957, University of New Mexico | Wyo. | Donald Lee Prichard A.B. in Govt. 1957, The George Washington University | Va. |
| Harvey Kaye B.S. in T.E. 1956, Lowell Technological Institute | Va. | Marvin Reich B.S. 1953, Polytechnic Institute of Brooklyn | Md. |
| Sanford Miller Kesten A.B. 1957, University of Michigan | Mich. | Thomas Otto Ruppert, Jr. A.B. in Govt. 1957, The George Washington University | Va. |
| Stefan Jay Klauber A.B. 1953, Cornell University | Md. | Alfred William Schumann B.S. 1949, Lewis and Clark College | Va. |
| James Bracken Lee B.S. 1952, U.S. Military Academy | Utah | Edward Semonian, Jr. A.B. in Govt. 1955, The George Washington University | Va. |
| James Hunter McNenny A.B. 1956, Miami University | Ohio | Warrington Gilmore Smith B.S. 1949, M.B.A. 1950, University of Maryland | Md. |
| John Curtis Moore A.B. 1954, University of Texas | Texas | Michael Jon Sweedler B.E. 1957, Yale University | N.Y. |
| Louis Anton Moucha B.S.E. 1950, University of Connecticut | D.C. | Ernest Albert Warden A.B. 1955, Municipal University of Wichita | Kans. |
| M.S. in E.E. 1952, Lehigh University | D.C. | James Richard Weaver B.S. 1957, Elizabethtown College | Pa. |
| John Joseph Mullally B.S. 1953, Georgetown University | Nev. | Paul Wohl A.B. in Govt. 1954, The George Washington University | Va. |
| Vale Patrick Myles B.S. in E.E. 1953, University of Nevada | Va. | | |
| Gayle Parker B.S. in I.E. 1956, Lafayette College | | | |

FEBRUARY 22, 1961

| | | | |
|--|------|---|-------|
| William Curtis Alford, Jr. B.S. 1956, M.B.A. 1957, American University | Md. | Robert Michael Guttman A.B. 1952, Harvard University | D.C. |
| Frank David AuBuchon B.S. in M.E. 1957, University of Missouri | Va. | Blair Parks Hall A.B. 1952, University of Maryland | Md. |
| Ernest Sigmund Auerbach A.B. in Govt. 1958, The George Washington University | Md. | Neal Hambleton A.B. 1956, University of Delaware | Md. |
| Arthur Francis Bronczyk A.B. 1954, Maryknoll College | Va. | Walter Henderson B.S. 1953, U.S. Military Academy | Va. |
| Thomas Yellott Canby, Jr. A.B. 1952, University of Virginia | Md. | Frank Clarence Hilberg, Jr. A.B. 1956, University of Virginia | D.C. |
| Anna Joyce Capps A.B. 1957, The George Washington University | D.C. | Howard Hosmer, Jr. A.B. 1954, Pennsylvania State University | Va. |
| Loren Merle Carlson A.B. 1948, Yankton College | S.D. | Donald Dyer Jeffery B.S. 1957, University of Wisconsin | Va. |
| A.M. 1952, University of Wisconsin | | Peter Jeffrey B.S. in B.A. 1955, Ohio State University | Wash. |
| Lincoln Drury Catthers B.S. 1956, Webb Institute of Naval Architecture | Md. | Fred Aivars Keire B.S. in Chem.E. 1957, University of Washington | Va. |
| Peter Aull Cerick A.B. in Govt. 1953, The George Washington University | Va. | Adrian John LaRue B.S. 1956, Virginia Polytechnic Institute | Md. |
| Walter Theodore Charton B.S. 1952, University of Maryland | Va. | Julian Paul Lawson A.B. 1954, University of Maryland | Va. |
| Kurt Rickey Conner A.B. 1958, Guilford College | Md. | Charles Richard Lepchinsky B.E.E. 1957, The George Washington University | D.C. |
| John Alexander Dahlstrom B.S. 1956, University of Utah | N.C. | Herbert Levine B.S. 1948, Brooklyn College | Va. |
| Roland Meade Dameron, Jr. B.S. in E.E. 1957, Virginia Polytechnic Institute | Utah | Jean Mansur B.S. 1946, University of Kansas | Md. |
| Frank Leslie Deierhoi A.B. 1949, College of William and Mary | Va. | Lawrence Stanley Margolis B.S. in M.E. 1957, Drexel Institute of Technology | Idaho |
| James Edward Denny B.E. 1953, Johns Hopkins University | Va. | Patricia Louise McDermott A.B. 1958, Idaho State College | Va. |
| Dan Donato, Jr. B.S. 1950, College of Charleston | Md. | Mary Alice McEniry B.S. 1942, University of Alabama | D.C. |
| Frank Louis Fetta A.B. 1954, Providence College | Va. | Robert Jay Miller B.S. in C.E. 1957, Pennsylvania State University | Va. |
| Edward James Freeman A.B. 1951, Johns Hopkins University | N.Y. | Sheridan Lew Neimark B.S. in Chem.E. 1957, Carnegie Institute of Technology | Va. |
| Charles Freeman Geschickter, Jr. A.B. 1955, Wesleyan University | Va. | Dexter Stetson Odin B.S. 1956, University of Florida | N.C. |
| Ronald Sanford Goldberg B.S. 1955, University of Maryland | Md. | Jack Ewart Phillips A.B. 1955, University of North Carolina | Va. |
| David Franklyn Grant B.S. 1950, University of Vermont | Md. | John Dwight Poffenberger B.I.E. 1957, Ohio State University | Va. |
| John Robert Grinnell B.S. in P.E. 1950, A.M. in Ed. 1951, The George Washington University | Va. | Raymond Hugo Quist B.S. 1957, Newark College of Engineering | Va. |
| | | Sheldon Foster Raizes B.S. in C.E. 1957, University of New Mexico | |

| | | | |
|---|------|---|------|
| Gerald Stuart Rosen B.S. 1950, Michigan State University of Agriculture and Applied Science | Md. | James Enlo Smith B.S. 1952, South Dakota School of Mines and Technology | S.D. |
| Thomas Jefferson Rothrock B.S. 1953, University of Maryland | Va. | Dennis Truman Snyder A.B. 1957, University of Maryland | Md. |
| Robert Morton Sandler A.B. 1958, The George Washington University | D.C. | Charles Alan Stein B.S. 1954, Duke University | Md. |
| Arvid Andrew Sather A.B. 1954, University of Minnesota | Wis. | Thomas Locis Tarolli B.Chem.E. 1956, University of Florida | Va. |
| Dean Schron B.E.E. 1956, Rensselaer Polytechnic Institute | Va. | David Thomas Terry B.S. in I.E. 1957, University of Pittsburgh | Va. |
| Leland Ancel Sebastian B.S. 1952, Arkansas State Teachers College | Ark. | John Charles Telford B.S. in Chem.E. 1956, Purdue University | D.C. |
| Kenneth Fred Sippel A.B. 1950, University of California | Va. | Wayne Day White A.B. 1954, University of Michigan | Va. |
| Thomas Frank Smegal, Jr. B.S. in Chem.E. 1957, Michigan College of Mining and Technology | Va. | Harold Anthony Williamson B.S. in M.E. 1957, University of Wisconsin | Va. |
| | | Leonard Alfred Willson, Jr. B.M.E. 1957, North Carolina State College | N.C. |

JUNE 7, 1961

| | | | |
|--|-------|---|-------|
| Donald Ralph Antonelli B.S. in E.E. 1957, Purdue University | Va. | Donald William Graves B.C.E. 1957, Cornell University | Va. |
| Richard Volker Armstrong A.B. 1958, University of Oklahoma | Okla. | Henry G. Green A.B. 1958, Louisiana State University and Agricultural and Mechanical College | Va. |
| Robert Freeman Asleson B.S., B.B.A. 1958, University of Minnesota | Minn. | Roosevelt Browne Greene, Jr. A.B. 1958, The George Washington University | Va. |
| David Sheldon Band B.S. 1958, University of Maryland | D.C. | Seymour David Gunod A.B. in Govt. 1949, The George Washington University | Md. |
| Ira Philip Barisky B.S. 1959, New York University | Va. | Jack Herbert Hall B.Ch.E. 1957, Rensselaer Polytechnic Institute | Va. |
| Harry Clark Bell, Jr. B.S. 1957, Georgetown University | N.Y. | Ronald Moyer Halvorsen B.S. in C.E. 1957, Drexel Institute of Technology | Va. |
| Margaret Anne Beller A.B. 1953, A.M. 1957, The George Washington University | Md. | Louis Francis Heeb B.M.E. 1955, General Motors Institute | Ind. |
| Albert Chick Blanchard A.B. 1958, Yale University | Maine | William Edwin Hegle B.S. in F.S. 1949, Georgetown University | Md. |
| William Sherwin Broadhead A.B. 1956, Idaho State College | Idaho | Harvey Sander Hertz B.S. in E.E. 1955, University of Colorado | Va. |
| Richard Sutton Buck IV A.B. 1958, University of Maryland | Va. | Stanley Manuel Hochhauser A.B. 1958, Brooklyn College | N.Y. |
| John Francis Carney B.S. 1957, Northeastern University | Va. | Gary Clark Honeycutt B.S. 1954, University of Arkansas | Va. |
| Alan William Cheever B.S. 1958, New England College | Va. | James Joseph Horgan B.S. 1957, LaSalle University | Del. |
| Barry Loomis Clark B.S. in M.E. 1956, Northwestern Technological Institute | Ill. | Thomas Braden Hunter B.S. in Ch.E. 1956, Case Institute of Technology | Va. |
| Paul Maxwell Coble B.S. 1957, M.S. 1958, Massachusetts Institute of Technology | D.C. | John David Jackson B.S. 1958, University of Maryland | Va. |
| Austin Brundage Comstock A.B. 1956, Northwestern University | Md. | Bernice Harriet Jacobsen Ed.B. 1947, Wisconsin State College, River Falls | Wis. |
| Joseph Allan Cooke B.S. in C.E. 1957, Drexel Institute of Technology | Pa. | A.M. 1954, The George Washington University | Va. |
| Kelly Ozzelle Corley B.S. 1955, Mississippi College | Va. | Harold Dudley Jastram B.S. in E.E. 1957, South Dakota State College of Agriculture and Mechanic Arts | Va. |
| William Edward Cox A.B. 1954, Bucknell University | Va. | Raymond Eric Johnson B.C.E. 1958, Rensselaer Polytechnic Institute | D.C. |
| Donald Lee Dennison B.S. in M.E. 1955, Carnegie Institute of Technology | Md. | Charles Sherry Jones B.S. in C.E. 1955, Duke University | Va. |
| William B. Dickinson A.B. 1958, University of New Mexico | Va. | Harry Chapman Jones III B.S. 1957, Yale University | Va. |
| Robert Roy Dively A.B. 1957, Pennsylvania State University | Va. | Clarence Cyrus Keiser, Jr. A.B. 1954, University of the South | Md. |
| Ronald Kaye Dunton A.B. 1954, Dartmouth College | D.C. | Walter Kruger B.S. in M.E. 1956, Lafayette College | Va. |
| Davis Blair Dwinell B.S. 1957, Pennsylvania State University | Vt. | Norman Nathan Kunitz B.S. in E.E. 1957, Drexel Institute of Technology | Pa. |
| Robert Hodgskin Erdmann A.B. 1958, University of Vermont | D.C. | Clarence Victor LaBonte, Jr. A.B. 1958, Cornell University | Mass. |
| Semi Feuer A.B. 1958, The George Washington University | Va. | | |
| Jack Lloyd Foltz B.S. in Ch.E. 1957, Rose Polytechnic Institute | | | |

| | | | |
|--|-------|--|-------|
| Jay Calvin Langston | Mont. | Fred Willie Sherling | Tenn. |
| B.S. 1957, Montana State College | | B.S. in Ch.E. 1957, University of Tennessee | |
| Earl Levy | Va. | Raymond Stevens Smethurst, Jr. | D.C. |
| B.E.E. 1952, Rensselaer Polytechnic Institute | | B.Met.E. 1958, Cornell University | |
| John Jacob Mackiewicz | N.Y. | Edward Jarrin Snyder | Md. |
| B.Ch.E. 1957, Yale University | | A.B. 1955, Catholic University of America | |
| Richard Leo Madden | Va. | Earl Chester Spaeth | Va. |
| B.S. 1956, Indiana University | | A.B. 1942, Oberlin College | |
| Philip David Main | Conn. | Ph.D. 1946, University of California at Los Angeles | |
| A.B. 1958, Bates College | | George Pete Stavros | Ky. |
| Robert Marrero | Va. | A.B. 1958, Centre College | |
| A.B. 1958, The George Washington University | | Murray Robert Stein | Md. |
| Edwin Floyd McDermott | D.C. | B.S. 1953, D.C. Teachers College | |
| A.B. 1951, Denison University | | Garth A. Stephenson | Md. |
| Matthew Kenneth McElhaney | Va. | A.B. 1951, Brigham Young University | N.Y. |
| A.B. 1954, Thiel College | | Sheldon Stern | |
| Clifford Johnson Moody | Va. | B.S. 1958, New York University | Idaho |
| A.B. 1958, University of New Hampshire | | Beverly Joan Stiburek | |
| Donald Russell Motsko | Va. | B.S. 1955, Brigham Young University | |
| B.S. 1957, Pennsylvania State University | | Steven Faraday Stone | |
| John Herbert Mulholland | Ill. | B.Ch.E. 1957, Rensselaer Polytechnic Institute | |
| B.S. 1957, University of Illinois | | Jan Arthur Strompf | Md. |
| George Joseph Neilan | Va. | B.S. 1958, University of Maryland | |
| B.E. 1957, Yale University | | Grant Russell Sykes | D.C. |
| Charles Robert Nichols | N.M. | B.B.A. 1950, Tulane University | |
| A.B. 1958, University of New Mexico | | A.M. in Govt. 1953, The George Washington University | |
| Francis James O'Rourke | Mass. | David Teschner | Va. |
| B.S. 1955, Northeastern University | | B.S. in E.E. 1955, Newark College of Engineering | |
| Thomas Lee Peterson | Va. | John Charles Thompson | Va. |
| B.S. in I.E. 1956, Stanford University | | B.S. 1957, University of Rochester | |
| David Pollack | Va. | William Clarence Thornton | N.Y. |
| B.S. in A.E. 1956, University of Miami | | A.B. 1958, University of Nevada | |
| Morris Irwin Pollack | | Ethan Allen Turshen | |
| B.S. in M.E. 1954, Newark College of Engineering | | A.B. 1954, Kenyon College | |
| Parnell Jearl Porter, Jr. | Va. | M.P.A. 1955, Syracuse University | |
| A.B. 1958, University of Pittsburgh | | John Klaas Uilkema | |
| Robert Ralph Priddy | Md. | B.S. in M.E. 1957, University of Michigan | |
| B.S. 1958, Principia College | | John Perley Vandenburg | Mich. |
| Jerry Arthur Rabinowitz | N.Y. | B.S. in E.E. 1956, University of Michigan | |
| A.B. 1958, West Virginia Wesleyan College | | Franklin Joseph Visek | Neb. |
| John Charles Randa | Wis. | B.S. in B.A. 1957, Municipal University of Omaha | |
| B.S. in E.E. 1957, Marquette University | | John Robert Waller | Md. |
| George Thomas Rawding | N.J. | B.S. 1953, Georgetown University | |
| B.B.A. 1958, Upsala College | | Robert George Weilacher | Va. |
| Ralph Raymond Reiser, Jr. | Md. | B.S. 1957, Columbia University | |
| A.B. 1955, University of Washington | | John Edward Welch | Maine |
| S. Jesse Reuben | | B.S. in Agron. 1953, University of Maine | |
| A.B. 1958, The George Washington University | | Melvin Pearson Williams | Va. |
| Gordon Albert Richardson | Md. | B.E.E. 1957, Rensselaer Polytechnic Institute | |
| B.S. 1958, The George Washington University | | Warren Jay Willinger | N.Y. |
| Irwin Bennett Rosenstein | Conn. | A.B. in Govt. 1959, The George Washington University | |
| B.S. 1958, University of Pennsylvania | | Betty Marie Wisecarver | |
| Bertram Irwin Rowland | | A.B. 1957, Mary Washington College | |
| B.S. 1950, University of California at Los Angeles | | William Henry Witt | Md. |
| Ph.D. 1954, University of Washington | | A.B. 1941, Harvard University | |
| Harold Aram Sakayan | D.C. | Raymond Leroy Worthington | Md. |
| B.S. 1957, University of Maryland | | B.S. 1941, University of Maryland | |
| Otto Schmid, Jr. | Va. | Robert Lloyd Zieg | |
| B.E.E. 1953, Georgia Institute of Technology | | B.I.E. 1956, General Motors Institute | |
| William Nelson Schnell | Ill. | | |
| A.B. 1958, University of Illinois | | | |
| Melvin Sharp | Pa. | | |
| B.S. in E.E. 1957, Drexel Institute of Technology | | | |

BACHELOR OF LAWS IN NATIONAL UNIVERSITY

JUNE 7, 1961

Leon B. Zeiger

D C

JURIS DOCTOR

OCTOBER 22, 1960

| | | | |
|--|-------|---|-------|
| Robert Frederick Allnutt B.S. in I.E. 1957, Virginia Polytechnic Institute | Va. | Julian S. Levitt B.S. 1951, College of the City of New York M.S. 1953, Kansas State College | D.C. |
| Yvonne Huguet Behart Licence es Lettres d'Anglais 1949, University of Bordeaux, France | Md. | Nancy Lou Provost A.B. 1956, Pembroke College | Conn. |
| Ralph Henry Chilton B.S. in M.E. 1952, Purdue University | Va. | Jon Sheldon Saxe B.S. in Chem. E. 1957, Carnegie Institute of Technology | D.C. |
| David Paul Cullen B.S. in Geol. E. 1956, M.S. in C.E. 1957, Oklahoma University | Va. | Malcolm Livingston Sutherland B.S. in Chem. E. 1957, Carnegie Institute of Technology | Va. |
| George Baxter Dunaway B.S. in Chem. E. 1950, Alabama Polytechnic Institute | Texas | Robert Vernon Vickers B.M.E. 1957, General Motors Institute | Va. |
| Melvin Carl Garbow B.S. 1953, Purdue University | Ill. | Albert Sheldon Weyer B.S. in Chem. E. 1956, University of Wisconsin | Va. |

FEBRUARY 22, 1961

| | | | |
|---|------|--|------|
| Hugh Yancey Bernard, Jr. A.B. 1941, University of Georgia B.S. 1947, Columbia University | Va. | Eugene Gary Horowitz A.B. in Govt. 1958, The George Washington University | D.C. |
| Alfred Fearing Bridgman, Jr. B.S. 1954, U.S. Coast Guard Academy | Mam. | John Christian LaPrade B.S. 1957, New Mexico College of Agriculture and Mechanic Arts | Va. |
| Stanley Howard Cohen B.S. 1957, Drexel Institute of Technology | Md. | Francis Arthur Paintin B.S. in Ch.E. 1951, Case Institute of Technology | Ohio |
| Sheldon Feldman A.B. 1957, The George Washington University | Md. | Arnold Edward Renner B.S. in E.E. 1954, Purdue University | Va. |
| Harvey Jack Gordon B.B.A. 1952, College of the City of New York M.P.A. 1956, Harvard University | Md. | | |

JUNE 7, 1961

| | | | |
|--|-------|--|-------|
| George LaVern Albright B.S. 1954, Brigham Young University | Nev. | Robert R. Perko B.S. in F.S. 1950, Georgetown University | Va. |
| Lawrence Herbert Berul B.S. in Com. 1957, Drexel Institute of Technology | Md. | Michael Terry Platt B.E.E. 1957, Rensselaer Polytechnic Institute | N.Y. |
| Harold Randall Bixler A.B. 1957, Michigan State University of Agriculture and Applied Science | Va. | George Richard Powers B.S. 1957, University of Illinois | Va. |
| Joseph Vincent Colianni B.E.E. 1956, University of Detroit | Mich. | Jenny Krohn Rose A.B. 1958, Hood College | N.J. |
| Gene Oliver Enochson B.S. 1954, Jamestown College | N.D. | Charles H. Schwartz B.S. in E.E. 1957, Drexel Institute of Technology | Pa. |
| James Peter Gregory A.B. 1956, Brown University | Conn. | Kenneth John Sherk B.S. in Com. 1955, State University of Iowa | Iowa |
| Clyde Henry Hamilton, Jr. B.S. 1956, Wofford College | S.C. | Natalie Trousof A.B. 1947, A.M. 1950, Columbia University | D.C. |
| Janet Goldrich Kohn (With distinction) | D.C. | William Edward Watson A.B. 1958, West Virginia Wesleyan College | W.Va. |
| James Edwin Lemert B.S. in E.E. 1957, Purdue University | Ohio | James William Williams B.S. in E.E. 1957, Vanderbilt University | Va. |
| William Woods McDowell, Jr. (With distinction) | Md. | Robert Wayne Wise B.S. 1956, McPherson College | Va. |
| B.E. 1953, Johns Hopkins University | | | |
| Gerald Joseph Mossinghoff B.S. in E.E. 1957, St. Louis University | Va. | | |

MASTER OF LAWS

FEBRUARY 22, 1961

| | | | |
|---|-------|--|-----|
| Charles Gailord Luellman A.B. 1952, LL.B. 1958, University of Nebraska | Nebr. | Les J. Weinstein B.S. in M.E. 1956, University of Pennsylvania J.D. 1959, The George Washington University | Pa. |
|---|-------|--|-----|

JUNE 7, 1961

| | | | |
|--|------|--|-----|
| J. Francis Fowles, Jr. B.S. 1946, University of Idaho LL.B. 1949, University of Utah | N.M. | John Charles Lyons A.B. 1956, University of Rhode Island LL.B. 1960, Georgetown University | Va. |
|--|------|--|-----|

Jack Harvey Olender
A.B. 1957, LL.B. 1960, University of
Pittsburgh
Vernon Amos Peltzer
A.B. 1941, DePaul University
J.D. 1953, The George Washington
University

Pa. Daniel Joseph Sammon
B.S. in E.A. 1957, Case Institute of
Technology
Ill. L.L.B. 1960, Georgetown University
Julius Elwood Slover
B.S. in Ed. 1942, Southeast Missouri
State College
LL.B. 1947, University of Texas

Ohio

Mo.

MASTER OF COMPARATIVE LAW

OCTOBER 22, 1960

Mario Franzosi
Laurea in Giurisprudenza 1956, Università
degli studi di Milano

Italy

Sang Ik Moon

LL.B. 1954, Seoul University

Korea

FEBRUARY 22, 1961

Raden Mohamad Sudjiman
M.L. 1948, Kyoto University, Japan

Indonesia

DOCTOR OF JURIDICAL SCIENCE

JUNE 7, 1961

Gordon A. Christenson
B.S.L. 1955, LL.B. 1956, University
of Utah

Utah

DISSERTATION: "Individuals before In-
ternational Tribunals: Direct Access
in Private Matters"

THE SCHOOL OF ENGINEERING

BACHELOR OF CIVIL ENGINEERING

OCTOBER 22, 1960

James Peter Hum

D.C.

FEBRUARY 22, 1961

Anthony Stephen Basile

Md.

JUNE 7, 1961

Thomas Patrick Carroll, Jr.
Donald White Evick
Alfred Eugene Johnson, Jr.

D.C.
Md.
Va.

Paul Enos Rova
John Ellsworth Williams

N.H.
Va.

BACHELOR OF ELECTRICAL ENGINEERING

OCTOBER 22, 1960

John Glanville Dunn
Lawrence Fumio Hatakeyama
A.B. 1951, University of Hawaii

Md.
D.C.

Nicholas Charles Kopulos
Fabian Thomas Liss
Jack Nimetz

D.C.
Md.
D.C.

FEBRUARY 22, 1961

Joseph Edward Ferris
Frederick Carl Hallberg
John Francis Kane

Va.
Conn.
Md.

Steven Tsakos
Charles Lamont Whitham

D.C.
Va.

JUNE 7, 1961

Harold Louis Boerlin II
Arthur William Brooks, Jr.
Douglas McCord Early
Kitt Earl Gilbiland
Thomas John Golab
(With distinction)
Daniel Bowles Havens

D.C. Kenneth Fergusson Hewitt
Md. Clifford Philip Holton
Md. John Virgil Howie
D.C. James Edwin Jennings
Md. James Aloysius Kinnahan
Gee Chek Lin
Va. Charles Vincent Moyer

Va.
Mass.
Miss.
Va.
D.C.
D.C.
Va.

John Joseph Milles
William Perazich
Edward Givens Sharp
Allan Ray Tarleton

Va.
D.C.
D.C.
Va.
Henry Moffette Tharpe, Jr.
George Emile Titcomb
Franklin Rafael Wiesman
Herbert Swann Wilkinson II

Va.
D.C.
D.C.
Md.

BACHELOR OF MECHANICAL ENGINEERING

FEBRUARY 22, 1961

Lawrence William Boehly
Madan Gopal Dhawan
A.B. 1953, Punjab University, India

Va.
India
Roger Frederick Mead
Md.

JUNE 7, 1961

Edwin Cogswell Austin
Parth Chander Dhir
B.S. 1955, City College of Calcutta,
India

Va.
D.C.
Rocco Richard Palmisano
Md.
Jan Alfred Paternaster
Md.

Almon Andrew Gray
James Wallace Joyce, Jr.
George Mon
Muninggih Hartoko Notowidigdo
Joseph Edward Ozefovich

Va.
D.C.
D.C.
D.C.
Pa.
Dirse Wilkis Sallet
Bernard Charles Schuler
Michael Szwec
Robert Eggimann Underwood
Md.
Va.
Va.
D.C.

BACHELOR OF SCIENCE IN ENGINEERING

OCTOBER 22, 1960

Wallace Brooks Jansen

Va.
Edward Wallace MacLaren, Jr.
Mass.

JUNE 7, 1961

Roland Keener Bennett
Garet Alexander Bornstein
George Kaplan
Peter Gad Morehouse

Md.
D.C.
Va.
Md.
Kendrick Wellman Parks
Harold Siminski
James Chaffin Wade, Jr.
Va.
Va.
Va.

MASTER OF ENGINEERING ADMINISTRATION

FEBRUARY 22, 1961

John Drummond Burky
B.S. in C.E. 1935, University of
Colorado

Idaho
Louis Samuel Rotolo
Md.
B.S. in E.E. 1951, University of
Michigan

James Constantino
B.S. in M.E. 1958, University of
Massachusetts

Va.
William Robert Stinchcum
Va.
B.S. 1928, Yale University

Stanley Carl Feldman
B.S. in Eng. 1958, Tufts University

Mass.
Irving Joseph Superfine
Ind.
B.S. 1938, U.S. Naval Academy

Joseph Roger Folio
B.S. in M.E. 1937, B.S. in C.E. 1952,
Carnegie Institute of Technology

Pa.
Louis Martin Tierney
Md.
B.S. in E.E. 1947, University of
Maryland

Richard Wen-Han Lee
B.S. 1948, Chiao Tung University,
China

Md.
Allison Howes Whorf
Md.
B.S. in E.E. 1952, University of
Massachusetts

Edward Franklin Mitchell, Jr.
B.E.E. 1956, University of Virginia

Va.
Joseph Frederick Zauner, Jr.
Md.
B.M.E. 1949, Catholic University of
America

JUNE 7, 1961

Robert Max Buck
B.S. in E.E. 1944, Worcester Polytechnic
Institute

Md.
James Lill Hinson
Md.
B.S. in Ch.E. 1953, University of
Maryland

Carol Elmer Burtner
B.S. in C.E. 1947, Worcester Polytechnic
Institute

Va.
Robert Irvin Hughes, Jr.
Ala.
B.E.E. 1950, Georgia Institute of
Technology

Walter Steril Daron
B.S. 1954, Pennsylvania State University

Va.
Isaac Lyman Ledbetter, Jr.
Va.
B.S. in C.E. 1933, Alabama Polytechnic
Institute

Harold F. Davidson
B.S. 1940, College of the City of New York

Va.
Alvin Paul Lehnerd
Conn.
B.S. in E.E. 1952, Ohio University

Morris Alan Glatt
B.S. 1949, Michigan State University

Md.
Herbert Beatson MacLea
Md.
B.S. 1954, Trinity College

Lester C. Harlow
B.S. 1940, John Brown University

Ark.
Wilfrid James Mayo-Wells
D.C.
B.E.E. 1952, The George Washington
University

Jonathan Trumbull Hine
B.S. 1941, U.S. Naval Academy

William Augustin McCarty
B.S. in Arch. 1933, University of
Florida
Paul Joseph Queeney
B.S. 1932, University of Scranton
Phillip Kahan Reiss
B.C.E. 1956, University of Virginia

Fla. Frank Lindsay Robertson
B.S. in M.E. 1948, Michigan College
of Mining and Technology
Md. Helman I. Stern
B.S. in E.E. 1957, Drexel Institute
of Technology
Va. John Haynes Williams
B.S. 1951, D.C. Teachers College

Va.
D.C.
Va.

MASTER OF SCIENCE IN ENGINEERING

FEBRUARY 22, 1961

Albert Philip Canal
B.S. in E.E. 1958, University of
Missouri
Arnold Charles Meltzer
B.S. in Eng. 1958, The George
Washington University

Md. Frank Mathild Nelson
B.S. 1942, U.S. Naval Academy
Md. B.S. in E.E. 1948, Massachusetts
Institute of Technology
William Harold Young
B.S. in Nav. Arch. and Mar. Eng. 1956,
Webb Institute of of Naval Architecture

Fa.
Ohio

JUNE 7, 1961

Davinder Kumar Anand
B.M.E. 1959, The George Washington
University
George Nick Kambouris
B.S. in E.E. 1949, West Virginia
University

India Theodore Ronald Kornreich
C.Ch.E. 1958, College of the City of
New York
Md. Joseph Mittleman
B.E.E. 1958, College of the City of
New York

D.C.
Va.

THE SCHOOL OF PHARMACY

BACHELOR OF SCIENCE IN PHARMACY

OCTOBER 22, 1960

Carl Frederick Austerlitz

D.C.

JUNE 7, 1961

Edward Ralph Babst
Paul Richard Bergeron II
Edgar Grayson Collins
Joel Samuel Davis
William Hugh Fearer
Arthur Paul Herrmann, Jr.
Evelyn Carole Huston
Morton Keroes Hyman
Stanley Edward Karasik
A.B. 1957, The George Washington
University

Md. Conrad Anthony Leongini
Md. Haynes A. McDaniel, Jr.
Va. Anine-Ellen Moore
D.C. Ryland DeLano Packett
Md. Ernest Augustus Randelman, Jr.
Va. B.S. 1950, Wake Forest College
D.C. Ross Hain Swope
D.C. Myron Holly Winget, Jr.
D.C. B.S. 1956, University of Maryland

D.C.
Md.
Va.
D.C.
Va.
Pa.
Md.

THE SCHOOL OF EDUCATION

BACHELOR OF ARTS IN EDUCATION

OCTOBER 22, 1960

Ruth Kathryn Brewer
Eleanor Jane Browne
Frances Borroto Chester
Florence Shelton Clark
Ruth Lois Herman Cohen
Mary Sutherland Curry
Annette Diana Felber
Kenneth Aloysius Fulton
Marian Veronica Glashofer
Genevieve Alida Kvam
Carolyn Braund Lanier
Ruth Nunnally Laycock
Patricia Ann Matthews
Naomi Waller McLellan
(With distinction)
Robert Daniel Moore
Olivia Denniston Morgan
Joan Neely

Va. Deena Shirley Osheroff
Ga. (With distinction)
Va. Mary Helen Pastnyck
D.C. Barbara Bolin Russell
Md. Lorraine Shirley Sanders
Va. Agnes Grace Schwartzenburg
D.C. Helen Nunnally Simpson
Pa. Lillian Piggott Smith
Md. Judith Helena Sonosky
Va. Marilyn Gorschman Taske
Va. Laviece Edith Tribble
Va. Celita Blevins Varn
Texas (With distinction)
Va. Mary Lucille Weddle
Ky. Roselyn Ruback Weil
Md. Betty Jane Wrubel
Md.

Md.
Va.
Va.
Va.
D.C.
Va.
Va.
Md.
Va.
Va.
Ind.
Md.
N.Y.

FEBRUARY 22, 1961

| | | | |
|---|------|----------------------|------|
| Katherine Annette Bachmayer (With distinction) | S.D. | Carol B. Heiderman | Va. |
| Sandra Brotman | D.C. | Kathleen Walsh Reams | Md. |
| Louise Howard Burton | Va. | Elaine Lois Woolf | Va. |
| Susanne Laval Evers | Va. | Nancy Ellen Wright | D.C. |
| | | Linda Ann Zarin | D.C. |

JUNE 7, 1961

| | | | |
|------------------------------|--------|---------------------------|--------|
| Verna Dechene Algire | Va. | Patricia May McDaniel | Md. |
| James A. Antonellis | Va. | Laura Annette McDowell | Va. |
| Ellen Sara Baker | D.C. | Sandra Lee Mensch | D.C. |
| Helen Barbara Banister | D.C. | Patricia Jo Murphy | Va. |
| Katherine Seward Barnes | Md. | Donald Ray Palmer | W. Va. |
| Doris Jean Morgenthal Becker | D.C. | Janet Marie Pierson | Oreg. |
| Mary Bristoe Bland | Md. | Sharon Lea Rabinowitz | Md. |
| Silvia Estelle Bown | Va. | Judith Anne Ramberg | Va. |
| Russell Sanford Chestnut | Tenn. | Elizabeth Olmsted Ramsey | Va. |
| Margaret Baker Cochran | Md. | Pauline Van Norman Rice | D.C. |
| Irene Frances Cunin | Md. | Martha Ann Risher | D.C. |
| (With distinction) | | Sidney-Ann Roberts | Md. |
| Ann Gail Edelson | D.C. | Helen Eudene Roche | D.C. |
| Marion Doris Fischerund | Md. | Joan Berberich Roper | Va. |
| Sue Harriet Folgate | Va. | (With distinction) | |
| Peter Sue Ford | D.C. | Susan Ryder Skages | W. Va. |
| Roberta Kamen Gottesman | Md. | Anita Davis Smith | Va. |
| Mary Lois Hartgroves | Va. | Josephine Regar Speed | Va. |
| Leon Edward Hawkins | Va. | Fred Lowell Thomas | N.C. |
| Shirley Manheim Hennes | Ill. | Carolyn Elizabeth Tucker | D.C. |
| (With distinction) | | Chester Howard Twentymen | Va. |
| Christina Ahlm Holloway | Calif. | Charlotte-Ann Waters | Va. |
| Blanche B. Hotovy | D.C. | Virginia Vollmer Wav | Md. |
| Mary Ruth Jovner | Va. | Ernestine Elizabeth White | D.C. |
| Susan Kinnemann | Va. | Dorothy Frances Williams | Va. |
| Ruth Jane Kleinfeld | Md. | Linda Margaret Williams | D.C. |
| Joan Elizabeth Luks | Va. | Gwendolyn White Yance | Va. |
| Dorothy Alice Lund | Va. | Linda Elaine Yuter | Md. |
| Alice Jane Maguire | Va. | Resa Beverly Zall | Md. |
| Slater Eugene Marshall | Va. | | |

BACHELOR OF SCIENCE IN HOME ECONOMICS

FEBRUARY 22, 1961

| | | | |
|-----------------------|-----|---------------|-----|
| Rosalie Bryant Arnald | Md. | Jane Hikediek | Va. |
|-----------------------|-----|---------------|-----|

JUNE 7, 1961

| | | | |
|---|-----|--------------------------|-------|
| Doris Anne Lokerson (Special honors in Home Economics) | Md. | Imogene Allen Swearingen | Miss. |
|---|-----|--------------------------|-------|

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION

OCTOBER 22, 1960

| | | | |
|-------------------|------|-------------------------|------|
| Judith Ann Mohler | Ohio | Frances Smith Wall | D.C. |
| Roy Jerome Power | Md. | Herbert Duane Whetstone | Pa. |

FEBRUARY 22, 1961

| | | | |
|--------------------------|------|--------------------|-----|
| Harry James Oxford | D.C. | Harry Lee Wickline | Va. |
| Shirley Phyllis Polinger | D.C. | | |

JUNE 7, 1961

| | | | |
|------------------------|------|--------------------------|------|
| Nicholas Ralph Anzelmi | Pa. | Eugene Posati | Pa. |
| Robert James Barbieri | Pa. | Ronald Kenneth Reeves | Md. |
| Frank Charles Campana | D.C. | Jerry Michael Sluger | Pa. |
| Desmond Francis Gatti | Pa. | Lawrence Gregori Usiskin | N.Y. |
| Ralph Edward Kunze | Va. | Ellis Bowman Wisler, Jr. | Md. |
| Adele Pavis | Md. | | |

MASTER OF ARTS IN EDUCATION

OCTOBER 22, 1960

| | | | |
|--|------|--|-----|
| Grace Charlotte Aherna A.B. 1955, Principia College | N.J. | Mary Ann Ashton B.S. in Ed. 1957, Madison College | Va. |
|--|------|--|-----|

| | | | |
|--|--------|--|------|
| Helen McClure Baker | D.C. | William Berkley Martin | Va. |
| A.B. 1935, Eastern Kentucky State College | | A.B. 1950, Lynchburg College | |
| Harold Eugene Bayes | D.C. | Laurena Gay Matson | Md. |
| A.B. in Ed. 1939, The George Washington University | | A.B. 1937, College of William and Mary | N.J. |
| Doris Isabelle Billow | Pa. | William Theodore McCaffrey | |
| B.S. 1940, Pennsylvania State Teachers College, East Stroudsburg | | B.S. in C.E. 1935, Tri-State College | |
| Alice Estelle Braxton | D.C. | B.S.E. 1937, University of Michigan | |
| B.S. 1936, D.C. Teachers College | | M.C.E. 1942, Polytechnic Institute of Brooklyn | Pa. |
| Emily Taylor Brown | W.Va. | James Francis Murray, Jr. | |
| A.B. 1933, Shepherd State College | | A.B. 1950, Lebanon Valley College | Va. |
| Robert Maurice Brown | Va. | Audean Carter Norwood | |
| B.S. in P.E. 1941, University of Alabama | | B.S. in Ed. 1952, Oklahoma College for Women | D.C. |
| Edith Kleinberg Chasnov | Va. | Harrison James Parker, Jr. | |
| B.S. 1945, New York University | | A.B. 1946, Morgan State College | Va. |
| Doris Nadine Comby | D.C. | Lois Ferry Parks | |
| B.S. 1934, A.B. 1936, Oklahoma College for Women | | A.B. 1929, University of California at Los Angeles | Md. |
| Ruth Birtler Cornfield | Va. | Atherine Brown Pinkney | |
| A.B. 1934, University of California at Los Angeles | | B.S. 1942, Maryland State Teachers College, Bowie | Pa. |
| Ronald Arthur Dearden | D.C. | Charles Kreske Post | |
| B.S. in P.E. 1959, The George Washington University | | B.S. 1937, Lycoming College | N.Y. |
| Walter Frank Dunn | Va. | Donald Eugene Rameden | |
| B.S. 1952, East Tennessee State College | | B.S. in Ed. 1955, Concordia Teachers College | D.C. |
| Richard Duane Ernberger | Va. | Dermot Joseph Schnack | |
| B.S. in Ed. 1953, University of Tennessee | | A.B. in Ed. 1937, The George Washington University | D.C. |
| Alberta Lawson Ferguson | D.C. | Warren Albert Sheffey | |
| B.S. 1934, D.C. Teachers College | | B.S. in Ed. 1951, Coppin State Teachers College, Md. | D.C. |
| Walter Harold Ferrell | Va. | Samuel Silverman | |
| B.S. in Ed. 1959, The George Washington University | | A.B. in Ed. 1957, The George Washington University | Va. |
| Zenon Efthymiou Georgiades | D.C. | Charlotte Lee Tolley | |
| A.B. in Ed. 1957, The George Washington University | | A.B. 1939, College of William and Mary | Va. |
| Patricia Joanne Hanigan | N.J. | James Angelo Toompas | |
| B.S. in Ed. 1954, Indiana University | | B.S. 1949, Davis and Elkins College | Md. |
| Margaret May Herron | D.C. | Sarah Rogers Tucker | |
| A.B. 1955, Youngstown University | | B.S. in Ed. 1951, D.C. Teachers College | N.Y. |
| Ruth Hinkson | Md. | Leon Van Orman | |
| A.B. 1932, Phillips University | | B.S. 1956, New York State University Teachers College, Potsdam | Md. |
| Rex Lawrence Howard | Md. | Jacquelyn Van Solkema | |
| B.S. 1950, D.C. Teachers College | | A.B. 1936, Calvin College | D.C. |
| Harry Robert Huffer | Md. | Temple Tolbert Vest | |
| B.S. in P.E. 1954, University of Maryland | | A.B. 1941, Shaw University | Md. |
| Virginia Pearl Hymes | D.C. | Henrietta Ray Walker | |
| B.S. 1956, D.C. Teachers College | | A.B. 1943, East Carolina Teachers College | D.C. |
| Emily Elizabeth Johnson | D.C. | Mattie Fuller Walker | |
| B.S. 1949, Howard University | | B.S. 1951, Hampton Institute | Md. |
| Geraldine Hooper Jones | D.C. | Helen Pearl Weymouth | |
| B.S. in Ed. 1952, Hampton Institute | | LL.B. 1936, The George Washington University | Md. |
| Loretta Reeves Keller | Calif. | Harriet Elizabeth Whitaker | |
| A.B. 1959, Stanford University | | Ph.B. 1934, Pembroke College | Va. |
| Betty Jane Kenney | Ill. | Clara Lane White | |
| A.B. 1945, The George Washington University | | B.S. 1947, Virginia State College | D.C. |
| A.M. 1951, University of Illinois | | Frances Coles Wood | D.C. |
| Elizabeth Shelton King | Md. | B.S. 1953, Virginia State College | |
| A.B. 1935, Concord College | | Anne Cox Young | |
| Quintin Scougall Lander | Va. | A.B. 1928, Huntington College | |
| A.B. 1930, University of Wisconsin | | | |
| Mary Agnes Law | D.C. | | |
| B.S. 1935, Mississippi Southern College | | | |
| Michael Laurence Mark | D.C. | | |
| Mus.B. 1958, Catholic University of America | | | |

FEBRUARY 22, 1961

| | | | |
|--|------|--|------|
| Thelma Amdur | D.C. | John Wootbrock Englishman | N.J. |
| A.B. 1941, Brooklyn College | | A.B. 1955, Washington and Lee University | Va. |
| Betty Jeanne Attebery | D.C. | Robert Scobie Fairweather | |
| A.B. 1952, Arizona State University | | B.S. 1934, U.S. Naval Academy | Va. |
| Viola Prudence Bleckley | Md. | William Louis Fey, Jr. | Pa. |
| A.B. 1940, Piedmont College | | B.S. 1937, U.S. Naval Academy | |
| Clay Evans Brooks, Jr. | Md. | Helen Anne Folcik | |
| A.B. 1950, D.C. Teachers College | | A.B. in Ed. 1958, The George Washington University | Va. |
| Marilyn Tyler Brown | N.C. | Gladys Hollabaugh Fox | |
| A.B. 1957, Virginia Union University | | A.B. 1918, University of Arkansas | |
| Herbert Walter Henry Dankert | Va. | | |
| B.S. in P.E. 1939, Wittenberg University | | | |

| | | | |
|---|------|--|-------|
| Carol Mills Harris A.B. in Ed. 1950, West Virginia State College | D.C. | Leonard Mark Orloff B.S. in Ed. 1949, D.C. Teachers College | Md. |
| Louis R. W. Johnson B.S. in Ed. 1936, West Virginia State College | Va. | LL.B. 1956, Georgetown University | D.C. |
| John Schumann Mann B.S. 1957, University of Maryland | Md. | Sally Ann Evans Reifsnnyder A.B. 1950, The George Washington University | Va. |
| Marcella F. Mesarick B.S. 1941, Pennsylvania State Teachers College, Mansfield | Md. | Brooke Schumm B.S. 1927, U. S. Naval Academy | Texas |
| Charles Edward Offutt, Jr. A.B. in Ed. 1958, The George Washington University | Md. | Charles Paul Sheppard A.B. 1940, East Texas State College | Va. |
| | | Carter Nicholas Thorpe B.S. 1955, D.C. Teachers College | Va. |
| | | James Boyd Webb B.S. 1955, East Carolina College | Va. |
| | | Richard Warren White A.B. 1950, Brown University | Va. |

JUNE 7, 1961

| | | | |
|--|-------|--|------|
| Mary Anna Bartz B.S. 1955, University of Wisconsin | Va. | Cecelia Ann Marshall B.S. 1948, D.C. Teachers College | D.C. |
| Albert Joseph Bidwick, Jr. A.B. 1955, King's College | Md. | Michael Martin Mehalic, Jr. B.S. 1954, D.C. Teachers College | D.C. |
| Armand Mario Biscontini B.S. 1946, University of Scranton | Md. | Elsie Colston Mitchell B.S. 1951, D.C. Teachers College | D.C. |
| Bruce William Broderius B.S. 1957, Minnesota State Teachers College, St. Cloud | Minn. | Marjorie Brown Mizelle B.S. 1946, North Carolina State Teachers College, Fayetteville | Md. |
| Henry Frederick Busky B.S. in P.E. 1960, The George Washington University | Md. | Leander Robert Morgan B.S. 1954, D.C. Teachers College | D.C. |
| Lena Eloise Calkins A.B. in Ed. 1957, The George Washington University | Md. | Barbara Della Mowry B.S. 1954, D.C. Teachers College | Md. |
| Donald Arthur Cuttler B.S. in Ed. 1955, Pennsylvania State Teachers College, Indiana | Md. | Joanne Bouthilet Parker A.B. 1949, Radcliffe College | D.C. |
| Robert Crispin Czapiewski B.S. in Forestry 1951, Pennsylvania State University | Va. | Michael Paul Patchan, Jr. A.B. 1957, University of Maryland | Md. |
| Douglas Jigitts Davis B.S. 1952, Hampton Institute | Va. | Marie Lapinski Petrenko B.Mus. 1953, Syracuse University | Md. |
| Richard Burroughs Davis B.S. 1955, University of Maryland | Md. | Martha Ellen Waldo Gallion Powell B.S. 1944, University of Minnesota | Va. |
| Myrna Reeves Deason A.B. in Ed. 1938, University of Alabama | Md. | Daisy Frye Reed B.S. 1956, D.C. Teachers College | D.C. |
| Emma Virginia Ellmore B.S. 1930, Madison College | Va. | Salvatore Joseph Rinaldi Ed.B. 1951, University of Miami | Fla. |
| Robert Mitchell Foster B.S. 1951, University of Maryland | Md. | Donald Sharets Sachs B.S. 1952, Pennsylvania State Teachers College, Shippensburg | Va. |
| William Raymond Fox B.S. in P.E. 1954, The George Washington University | Md. | Ruth Hobbs Sangster B.S. 1934, D.C. Teachers College | Md. |
| Howard Samuel Giberson A.B. 1931, Harvard University | Va. | Esperance Lanpher Savage B.S. 1929, University of Vermont | Md. |
| Bettie E. Kilpatrick Greffet A.B. 1943, Texas Western College | Va. | Shirley Ann Smallwood B.S. 1953, D.C. Teachers College | D.C. |
| Rosemary Teresa Gutierrez A.B. 1946, Hunter College | D.C. | John Raymond Smith B.S. 1950, Maryland State Teachers College, Frostburg | D.C. |
| Lois Krause Harrison A.B. 1958, University of New Hampshire | Va. | Charles Lance Statler B.S. 1956, Maryland State Teachers College, Frostburg | Md. |
| Elizabeth Holmes Jones B.S. 1955, D.C. Teachers College | D.C. | Charlotte Mary Sult B.S. in Nursing 1954, Illinois Wesleyan University | Va. |
| Helen Washler Kemp A.B. 1931, Ball State Teachers College | Ind. | Janet Smith Thompson A.B. 1944, Madison College | D.C. |
| Gertrude Wilkins Kerr A.B. 1955, Lynchburg College | Va. | Alan Harold Townshend A.B. in Govt. 1957, The George Washington University | Va. |
| Norman Joseph Kerr Ed.B. 1951, Rhode Island College of Education | Va. | Donald Paul Turner B.S. in Ed. 1951, Maryland State Teachers College, Salisbury | Md. |
| Ann Agnes Kirby A.B. 1950, College of New Rochelle | R.I. | Emmett Carl Walker B.S. 1953, D.C. Teachers College | D.C. |
| Venera Virginia Lambros B.S. 1941, Maryland State Teachers College, Towson | Md. | Martha Lou Ware A.B. 1951, LL.B. 1953, University of Texas | D.C. |
| Julius Alexander Levay B.S. in P.E. 1951, Pennsylvania State Teachers College, East Stroudsburg | Md. | Dennis Reid Webb A.B. 1952, University of North Carolina | S.C. |
| Minna Romaine Marosy B.S. in Ed. 1960, Pennsylvania State Teachers College, Edinboro | Ohio | David Fife Welch A.B. 1940, Franklin College of Indiana | Ind. |
| | | James Nelson Young B.S. 1951, Virginia Polytechnic Institute | Va. |

ADVANCED PROFESSIONAL CERTIFICATE

OCTOBER 22, 1960

| | | | |
|---|------|--|--------|
| Betty Aleatha Brooks B.S. 1952, D.C. Teachers College A.M. 1954, New York University | D.C. | Marguerite Louise Shimp A.B. 1954, Shepherd State College A.M. in Ed. 1956, The George Washington University | W. Va. |
| Elsie Murtagh Hurley B.S. in Ed. 1939, College of the City of New York A.M. in Ed. 1953, The George Washington University | Va. | | |

FEBRUARY 22, 1961

| | | | |
|--|-----|---|-----|
| George William Anderson, Jr. B.S. in Ed. 1955, Maryland State Teachers College, Salisbury A.M. in L.S. 1960, Wesleyan University | Md. | Anne Mildred Hovle B.S. 1941, University of Maryland A.M. 1946, Columbia University | Md. |
|--|-----|---|-----|

JUNE 7, 1961

| | | | |
|--|------|--|-----|
| Ralph Frank Corrado B.S. 1953, D.C. Teachers College A.M. in Ed. 1958, The George Washington University | D.C. | Leila Virginia Hardesty B.S. 1941, University of Maryland A.M. in Ed. 1948, The George Washington University | Va. |
| Walter Frank Dunn B.S. 1952, East Tennessee State College A.M. in Ed. 1960, The George Washington University | Va. | Ruby Leffer Hare A.B. in Ed. 1955, A.M. in Ed. 1957, The George Washington University | Va. |
| Lyndale Harpster George B.S. in P.E. 1948, A.M. in Ed. 1952, The George Washington University | Md. | Cara Hamilton Peterson B.S. 1938, Virginia State College A.M. 1946, New York University | Va. |

DOCTOR OF EDUCATION

JUNE 7, 1961

| | |
|--|-----|
| Morris Edward Sumner A.B. 1952, Emory University Ed.M. 1958, Loyola College DISSERTATION: "A Study of Organized and Professionally Staffed Personnel Counseling and Guidance Programs in the Five Hundred Largest Private Industrial Corporations in the United States" | Md. |
|--|-----|

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS

BACHELOR OF ARTS IN GOVERNMENT

OCTOBER 22, 1960

| | | | |
|---|---|--|---|
| William Peter Babione Sandra Scharbach Funston John Dale Gilliland John Joseph Heberle Walter Lee Heffner, Jr. Douglas Lloyd Johnson Robert Dean Miller | Va. Kans. D.C. D.C. N.C. Calif. Va. | Abdullah Azhari Nuri Andrew Joseph Potts Robert Lynton Pritchard Lloyd Sang Ikk Shim A.B. 1958, Elizabethtown College Daniel Albert Taylor, Jr. John Henry van Santen, Jr. | D.C. Pa. Va. Korea D.C. Ohio |
|---|---|--|---|

FEBRUARY 22, 1961

| | | | |
|---|---|---|--|
| William Edward Carmichael Rowland Carlos Croft Mary Frances Crown Robert William Eilbeck Henry Akers Engelbrecht, Jr. William Thomas Glover Edward John Hino Judith Rose Irwin Cecil Beam Jones, Jr. Stewart Lynbury Lane Jaromir Joseph Michal Robert Hector Munn | Va. Utah D.C. Va. Md. Md. Pa. Va. Texas Md. D.C. Mass. | Robert Earl Nordstrom Edward Herbert Opack Robert Hawthorne Price, Jr. Elfriede Ann Remillard Lloyd Donald Roberts Richard Alvin Silas Russell Snaith Harry Lee Spear Gregory King Stone Constantine Harry Tseronis Kathryn Louise Zimmer | D.C. D.C. D.C. Mass. Va. Va. Va. D.C. D.C. |
|---|---|---|--|

JUNE 7, 1961

| | | | |
|---------------------------|------|-----------------------------|-------|
| Joseph Luther Arbena | Md. | Ruth Louise Gots | N.J. |
| Manoutchehr Ardalan | Iran | Stanley David Heckman | D.C. |
| William Haywood Ausman | D.C. | (With distinction) | |
| John Ross Bailer | Md. | Martin Richard Miller | Pa. |
| Vivien Muriel Crumly | Md. | Jerry Mack Newman | Va. |
| (With distinction) | | Floyd Clarence Plowman, Jr. | Mo. |
| William Thomas Daly | Ohio | Sarah Gail Roemheld | Fla. |
| (With distinction) | | William Norval Rogers | N.C. |
| George Bernard Dolan, Jr. | Fla. | Lillian G. Spiegel | D.C. |
| John Pierce Donley II | Ill. | Ruth Louise Timberlake | Texas |
| Richard William Engelbart | N.J. | Harold Joel Tomin | Ill. |
| David Edwin Feldman | D.C. | Judith Gail Wheelus | D.C. |
| Richard Hale Fischman | N.Y. | | |

BACHELOR OF BUSINESS ADMINISTRATION

JUNE 7, 1961

| | | | |
|--------------------------------------|--------|------------------------------------|---------|
| Bradley Wayne Adkins | W. Va. | Robert Gipsy Lineberry | Va. |
| Lewis Barber | Fla. | Douglas Donald Mann | Md. |
| Donald Francis Beach | D.C. | Douglas Monroe McMillan | Va. |
| David Hall Bernheisel | D.C. | Yura Darrell Meyer | Va. |
| Lawrence Charles Carone | Md. | Merritt Lee Murry | N.J. |
| Howard William Crumly | Md. | Roy Joseph Naquin | Va. |
| Richard Anthony Dement | Md. | Heoung Lock Oh | Korea |
| Ausma Drenitia | Md. | William Herman Peeples, Jr. | D.C. |
| Hanna Naim El-Asal | D.C. | William Collins Reagan | Md. |
| (With distinction) | | Margaret Elizabeth Robinson | Va. |
| William Ream Engelman | Va. | John William Saadi | Md. |
| Charles Robert Eskew | Va. | Marvin Paul Singman | D.C. |
| (With distinction) | | Lucille E. Sithens | Md. |
| Henry Hugh Frain | D.C. | Albert Harry Snyder | Pa. |
| George Goodwin Fulcher, Jr. | Md. | Mohamed Amine Soussane | Morocco |
| John Patrick Gardes | Va. | Ernest Paul Sult | Va. |
| Chester Harold Gray III | Va. | Norbert Harold Szymanowski | Md. |
| Thomas Hagood Haly | Pa. | John Owen Turner | Md. |
| Alan Price Hawkins | Texas | Mildred Warford | Minn. |
| Roy Jennings Heinbuch, Jr. | Va. | Jerry Dean Whitlock | Va. |
| Melvin Davis Herriman, Jr. | D.C. | Harold Kenneth Wilson | Pa. |
| Robert Jobson Hughes | Va. | LL.B. 1955, University of Oklahoma | |
| LL.B. 1951, University of Louisville | | George Edward Winkler | Md. |
| Ronald Edward Kaltz | Md. | David Homer Zirkle, Jr. | Va. |
| Judy Ann Lane | D.C. | | |

MASTER OF ARTS IN GOVERNMENT

OCTOBER 22, 1960

| | | | |
|------------------------------------|--------|----------------------------------|------|
| Allene Vartia Douma | Va. | Patrick James McEvoy | Md. |
| B.S. 1950, University of Minnesota | | B.S. 1956, Fordham University | |
| Thomas Lloyd Gregg | Calif. | William Raymond Nelson | Ohio |
| A.B. 1957, Stanford University | | B.S. 1956, Ohio State University | |

FEBRUARY 22, 1961

| | | | |
|---------------------------------------|-------|---------------------------------------|------|
| Martin Leon Askren | Ariz. | Martin Francis Murray, Jr. | N.J. |
| A.B. 1957, University of Arizona | | A.B. 1951, University of Pennsylvania | |
| Austin Palmer Cole | Iowa | Frank Robert Papp | Va. |
| A.B. 1956, University of South Dakota | | A.B. in Govt. 1957, The George | |
| Thomas Joseph Dodd, Jr. | Conn. | Washington University | |
| B.S. in F.S. 1957, Georgetown | | David Maria Salto | D.C. |
| University | | A.B. in Govt. 1958, The George | |
| Byron Lee Jackson | Mo. | Washington University | |
| A.B. 1957, Drury College | | | |

JUNE 7, 1961

| | | | |
|-------------------------------------|-------|--|-------|
| Merle David Baumgart | Oreg. | Robert Arnold Flaten | Minn. |
| A.B. 1959, Portland State College | | A.B. 1956, St. Olaf College | |
| Jack Merlin Belland | Wash. | Dwight Lee Gravitte | Va. |
| A.B. 1953, Montana State University | | A.B. in Govt. 1948, B.S. 1954, The George | |
| Bert Hubert Cooper, Jr. | S.C. | Washington University | |
| A.B. 1956, Furman University | | Elvin Ragnvald Heiberg III | N.Y. |
| Truman Bayne Cross | Oreg. | B.S. 1953, U.S. Military Academy | |
| A.B. 1959, Portland State College | | M.S. in C.E. 1958, Massachusetts Institute | |
| Robert William Elrod | Fla. | of Technology | |
| A.B. 1959, University of Florida | | | |

| | | | |
|--|-------|--|------|
| James Everett Hobbs A.B. 1954, University of Georgia | Va. | Chalmers Gail Norris, Jr. B.S. in Ed. 1956, Pennsylvania State Teachers College, Shippensburg | Md. |
| Jung Gun Kim A.B. 1958, University of Kansas City | Korea | James Robert Reid B.S. 1953, Michigan State Normal College | Md. |
| Gertrude Cecelia Laprade A.B. in Govt. 1957, The George Washington University | Va. | Allen Milton Singer A.B. 1952, The George Washington University | Md. |
| Gregory James Lock E.E. 1932, University of Cincinnati | Va. | William Histaspas Stewart, Jr. A.B. 1960, University of Alabama | Ala. |
| B.D. 1935, Virginia Theological Seminary | S.D. | | |
| Larry Vincent Luther A.B. 1959, University of South Dakota | | | |

MASTER OF ARTS IN PERSONNEL ADMINISTRATION

OCTOBER 22, 1960

| | | | |
|---|-----|--|-----|
| James Anderson Hazelrigs B.S. 1959, University of Maryland | Ga. | Thomas James Kerr A.B. 1957, University of Washington | Va. |
|---|-----|--|-----|

FEBRUARY 22, 1961

| | | | |
|--|----------|--|-------|
| Rajinder K. Ahuja A.B. 1953, LL.B. 1955, University of Delhi, India | India | Madge Louise Crouch B.S. 1947, Columbia University | D.C. |
| Sanesh Bhodhipathom LL.B. 1947, University of Thammasat, Thailand | Thailand | Merlyn Ralph Jones B.S. in Health Ed. 1952, Pennsylvania State Teachers College, East Stroudsburg | Md. |
| Richard Anthony Cocozza A.B. 1954, Merrimack College | Va. | Robert Ewing McCord B.S. 1947, U.S. Military Academy | Texas |

JUNE 7, 1961

| | | | |
|---|------|---|------|
| Richard Caldwell Gay B.S. in B.A. 1958, American University | D.C. | John Franklin Patrick B.S. in B.A. 1955, University of Virginia | Md. |
| Coleman Mandelblit A.B. 1954, College of the City of New York | Md. | Vivian Rebecca Banks Taylor B.S. 1955, Virginia State College | Va. |
| John Curran Massey A.B. 1936, St. Mary's University A.M. 1940, Catholic University of America | D.C. | Arthur Edward Vanderlinden II B.S. in Ed. 1958, Loyola University, La. | N.J. |

MASTER OF ARTS IN PUBLIC ADMINISTRATION

OCTOBER 22, 1960

| | | | |
|--|------|---|-------|
| William Edward Atwater B.S. 1941, University of Florida | Fla. | Elroy Louis Nieweg A.B. 1957, Allegheny College | Va. |
| James Vodra Coleman A.B. 1947, West Kentucky State College B.D. 1950, Union Theological Seminary | Ky. | William Hart Stewart B.S. 1949, U.S. Coast Guard Academy | Texas |

FEBRUARY 22, 1961

| | | | |
|---|--------|---|----------|
| James Carroll Daugherty A.B. 1954, Amherst College | Md. | David Hollingsworth McClain A.B. 1957, Duke University | Fla. |
| Paul Dallas Davis B.S. in Ed. 1943, Southeast Missouri State College | Va. | Carl Tatsuo Sakata A.B. 1951, Grinnell College | Hawaii |
| Allen Lewis Goodman A.B. 1959, University of Redlands | Calif. | Lee E. Walker B.S. 1958, Brigham Young University | Nev. |
| Peter Joseph Lord A.B. 1951, University of Wisconsin | Va. | Debebow Zelelie A.B. 1957, University College of Addis Ababa, Ethiopia | Ethiopia |

JUNE 7, 1961

| | |
|---|------|
| George Mihich A.B. 1954, University of Buffalo | N.Y. |
|---|------|

MASTER OF BUSINESS ADMINISTRATION

OCTOBER 22, 1960

| | | | |
|--|--------|---|-------|
| Richard Auslander B.S. 1957, University of Pennsylvania | N.Y. | Joseph Franklin Davis B.S. 1959, University of Maryland | Min. |
| Daniel George Cummins B.S. 1957, University of Maryland | Calif. | Maurice John Fazlollah B.S. 1959, University of Maryland | Mich. |

| | | | |
|--|-------|---|--------|
| Evans Jay Francis B.S. in B.A. 1950, University of Kansas | Va. | Clarence Montgomery Miller, Jr. B.S. in E.E. 1953, U.S. Air Force | Mo. |
| Lowell William Frederick B.S. in B.A. 1949, University of Buffalo | Md. | Institute of Technology | |
| Robert Clarence Gaskill A.B. 1952, Howard University | Va. | Henry Oland Farman, Jr. B.S. in B.A. 1956, Ohio State University | Ohio |
| Phillip Donald Grub A.B., A.B. in Ed. 1953, Eastern Washington College of Education | Wash. | Norman Arnold Rautiola B.S. in Met.E. 1954, Michigan College of Mining and Technology | Mich. |
| Frank Niles Halm B.S. 1956, University of Maryland | Oreg. | Robert Rotstan B.S. in Ed. 1953, University of Cincinnati | Calif. |
| John Smith Herrick B.S. in Chem.E. 1940, Michigan State University of Agriculture and Applied Science | Md. | John Albert Salyards, Jr. A.B. 1955, Syracuse University | Calif. |
| Hardy Lloyd Holt B.S. 1942, North Texas State Teachers College | Texas | Roy D. Simmons, Jr. B.S. 1959, University of Maryland | Ky. |
| Jerry Devereux Jarratt B.S. 1951, New York University | Texas | Jimmie Taylor B.S. in Aero.E. 1942, Agricultural and Mechanical College of Texas | Texas |
| Paul Henry Long B.S. 1959, University of Maryland | Wis. | John Alvin Trask A.B. 1941, Syracuse University | Ga. |
| Thomas Dillon Mara B.S. 1958, University of Maryland | Va. | George Ureke B.S. 1959, University of Maryland | Ill. |
| James Elliott Mechling B.S. 1940, Haverford College | N.J. | Howard Earl Weinbuff B.S. in B.A. 1948, University of Arizona | Ill. |
| | | Andrew Milton White B.S. 1947, Memphis State University | Tenn. |
| | | Herbert Louis Wurth B.S. 1959, University of Maryland | N.J. |

FEBRUARY 22, 1961

| | | | |
|--|-------|---|-------|
| Frank William Bauers, Jr. A.B. in Govt. 1950, The George Washington University | Texas | George William Glatia B.S. in B.A. 1955, Boston University | Mass. |
| Frederick Denman Buggie A.B. 1956, Yale University | Md. | James Loy Long B.S. in B.A. 1952, New Mexico College of Agriculture and Mechanic Arts | N.M. |
| James Sines Cogswell A.B. 1953, University of New Mexico | Conn. | Richard Harvey Shuford, Jr. A.B. 1948, Lenoir-Rhyne College | Va. |
| A.B. 1959, University of Maryland | | Mary Elinor Thompson B.S. in B.A. 1957, Ohio State University | Va. |

JUNE 7, 1961

| | | | |
|--|--------|--|--------|
| Bernard Abrams A.B. 1946, University of Pennsylvania | N.Y. | Robert Brown Grant B.S. 1951, U.S. Coast Guard Academy | Conn. |
| Louis Orin Alder B.S. in Mil.Sc. 1959, University of Maryland | Idaho | Stephen Stanley Douglas Griffith B.S. in M.E. 1945, University of Washington | Wash. |
| Barbara Anne Ames A.B. in Govt. 1958, The George Washington University | Va. | Robert Stephen Haley B.S. 1945, U.S. Naval Academy | N.Y. |
| Robert Edward Benson B.S. 1951, Morningside College | Iowa | Stuart Lee Harbour B.S. 1947, University of Illinois | Ill. |
| Robert Stephen Blassie A.B. 1946, Brown University | Pa. | Frank Walter Harding III B.S. 1950, Worcester Polytechnic Institute | Calif. |
| Byron Franklin Bond A.B. 1943, John B. Stetson University | Va. | Andrew Edgar Hare A.B. 1949, Bethany College | W.Va. |
| Bernard Milton Boreas B.S. in Ed. 1941, Glassboro State College | N.J. | John Nelson Hassell B.S. 1958, University of Maryland | Va. |
| Gilbert Victor Bresnick, Sr. B.S. in E.E. 1948, University of Maryland | Md. | Glenn Goodwin Haycraft A.B. 1940, The George Washington University | Md. |
| B.S. in Bus.Mgt. 1957, University of Baltimore | | Evan Griffith Highley, Jr. A.B. 1953, Lafayette College | Md. |
| William Edward Campbell, Jr. A.B. 1956, University of Texas | Texas | James Anthony Kaufflin B.S. in B.A. 1960, Ohio State University | Ohio |
| Rex Allen Deasy B.S. 1960, University of Maryland | Wash. | George Richard Kirmse A.B. 1951, Fordham University | N.Y. |
| Charles Edward Diehl B.Arch.E. 1948, Catholic University of America | Pa. | Elmer William Lyster, Jr. A.B. 1949, Temple University | Va. |
| E.C.E. 1952, Rensselaer Polytechnic Institute | | Seymour Meadow B.S. in Phar. 1949, University of Buffalo | N.Y. |
| Thomas Richard Downs B.S. 1947, A.M. 1949, Miami University | Va. | Harry Wayne Morgan, Jr. B.S. 1949, U.S. Naval Academy | Ohio |
| Orin Jordan Durey A.B. 1959, Tulane University | D.C. | James Phillip Morgan, Jr. B.S.C. 1948, Spring Hill College | Ala. |
| Charles Justice Ellis, Jr. A.B. 1942, Lafayette College | Pa. | James Kenneth Palmer A.B. in Ed. 1960, The George Washington University | D.C. |
| Daniel Joseph Ford B.S. in B.A. 1952, Boston College | Va. | Edwin Joseph Parker A.B. 1955, University of California | N.Y. |
| Howard Platt Granger B.S. 1951, University of Southern California | Calif. | James Henry Pfazing A.B. 1955, The George Washington University | Md. |

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|---|------|--|--------|
| Richard Herd Pierce | Fla. | Joseph Talago, Jr. | W. Va. |
| A.B. 1959, University of Maine | | B.S. in E.E. 1946, University of Kansas | |
| Harris Gordon Rogers, Jr. | Ga. | B.S. in E.E. 1947, Massachusetts Institute | |
| B.S. 1945, U. S. Naval Academy | | of Technology | Nebr. |
| Victor Anthony Ruvo | Pa. | Ernest Leroy Truax | |
| B.S. 1950, University of Pittsburgh | | B.S. 1947, U. S. Naval Academy | Texas |
| James Dickerman Small | N.Y. | Charles Carter Williams | |
| B.S. 1941, U. S. Naval Academy | | B.S. 1946, University of Washington | |
| Winston Bryant Stephens, Jr. | D.C. | | |
| B.S. 1946, B.S. in C.E. 1947, Duke University | | | |

DOCTOR OF BUSINESS ADMINISTRATION

OCTOBER 22, 1960

| | |
|--|-------|
| Joseph Carroll Golden | Tenn. |
| B.S. 1945, Tennessee Polytechnic Institute | |
| L.L.B. 1948, University of Tennessee | |
| M.B.A. 1954, The George Washington | |
| University | |
| DISSERTATION: "Prior Notification of Cor- | |
| porate Mergers: An Appraisal" | |

JUNE 7, 1961

| | |
|--|-----|
| Joel Elmore Ross | Va. |
| A.B. 1946, Yale University | |
| M.B.A. 1959, The George Washington | |
| University | |
| DISSERTATION: "Small Business Investment | |
| Companies and an Evaluation of the | |
| Small Business Investment Act of 1958 | |
| with a Background Study of Public | |
| Policy Affecting Small Business. Its Role, | |
| and the Availability and Adequacy of | |
| Financing" | |

THE COLLEGE OF GENERAL STUDIES

ASSOCIATE IN ARTS

OCTOBER 22, 1960

| | | | |
|------------------------|-----|--------------------------|-------|
| Richard Renato Burritt | Va. | Edward Anthony Wojcowski | Conn. |
| John Temple Dunn | Va. | Betty Heerwagen Wood | Ark. |
| Robert Francis Massimi | Md. | | |

FEBRUARY 22, 1961

| | | | |
|-------------------------|-------|-------------------------|--------|
| James W. Atwell | Va. | Jerry Kohout | Va. |
| Ruth Patricia Doyle | N.Y. | Glenn Carlyle Michel | Calif. |
| Clifton Earl Hand | N.J. | Rose Emily Ribakoff | Texas |
| John Clifton Honea, Jr. | Va. | Robert M. Sherwood | Va. |
| Martin A. Kendall | N.Y. | Esteban Unpingco Torres | Ga. |
| (With distinction) | | Harold Whorton | Pa. |
| James Francis Killeen | Tenn. | Elynore Jean Wilbur | N.C. |
| (With distinction) | | Samuel Edwin Williams | |
| John Wilson Knight, Jr. | Va. | | |

JUNE 7, 1961

| | | | |
|--------------------------|-------|----------------------|-------|
| Marion Allen Atwell | Md. | Clyde Eugene Hudson | Va. |
| Mary Harrover Ayers | Va. | (With distinction) | D.C. |
| Walter Irvin Berlin | Md. | Patrick E. Hughes | D.C. |
| Ritamae June Bouchard | Maine | (With distinction) | Ohio |
| Margaret Durant Bowden | Texas | Ellen Kemp | Md. |
| (With distinction) | | Nicholas Koss | Ga. |
| Richard H. Cave | N.C. | Wesley F. Krebeck | Okla. |
| Leonard Cohen | Va. | Randolph Manning | Va. |
| O. Wesley Corman | Ill. | Charles Leo Maxwell | Md. |
| William Holmer Crane | Fla. | W. Doris McCurdy | N.Y. |
| Edward Joseph Daley | Texas | John J. McIntyre | Va. |
| Robert George DeVine | Va. | William Edwin Moore | Va. |
| (With distinction) | | John Henry Murphy | D.C. |
| Raymond Joseph DiVacky | Va. | Lawrence L. Newhouse | D.C. |
| Beatrice Muller Eiesland | Va. | James F. Price | Minn. |
| Frederick K. Hahn | Pa. | Robert James Reed | D.C. |
| Leonard Hamer | Va. | Clayton C. Regier | D.C. |
| Howard Hodges Harris | Va. | Curtis B. Robinson | |

Degrees Conferred

351

Reaford Leroy Robinson
Donald H. Sherr
William J. Steele
John Vernon Waller

Okla. Ray Eugenia Walters
Calif. John A. Watkins
Va. Evelyn L. Watson
Md. Waldron J. Winter

Md.
Va.
Va.
Ill.

ASSOCIATE IN SCIENCE

FEBRUARY 22, 1961

John Loraine Pancoast
(With distinction)

Md. Robert Walsh Stevens

Md.

BACHELOR OF ARTS

OCTOBER 22, 1960

Kurt Frank Amende
Charles Joseph Bauer
Eugene James Carroll, Jr.
Martin Samuel Christie
Rance Endall Cotton
Karl Thornton Keller
Otto Barnhart Martinson, Jr.
Sidney Thomas Mixon

N.Y. John Robert Reed
N.Y. Carlyle H. Shurtleff
Pa. William Harvey Simon, Jr.
Va. Charles Beman Stevenson
Texas James Glenn Swensen
Mo. Robert Floyd Wenrick
D.C. John Charles Yearwood
La.

Ind.
Utah
Va.
Ohio
Va.
Ind.
Ga.

FEBRUARY 22, 1961

Bernard James Biady
Albert James Brown
Joe E. Chambliss
Benjamin August Fornonsini
Paul Alden Harmon
Robert Henry Kelly
Norman Joseph Kinley
John Phillip Lange
William Randolph Mathews, Jr.

N.J. John Lee Mohl
Md. Alfred Cesare Parker
Calif. Victor Bryan Penuel, Jr.
Conn. Vernon David Thomason
S.D. James Hamilton Todd
Mich. George Ernest Waesche
Minn. (With distinction)
Va. William Denithorne Wood, Jr.
Texas

Va.
Mass.
Texas
N.C.
Va.
Md.
N.J.

JUNE 7, 1961

George Witmer Allen
(With distinction)
Julian Gordon Bass, Jr.
Roly Arnold Beal
Leonard Harry Brody
Richard Lowerison Brownell
Eugene Marcus Bryant, Jr.
Ira Thurston Carr
Thomas A. Coleman
Oliver Reeves Davis
Ruby Earl Davis, Jr.
Dwight E. Decamp
Fred Joseph Diemer
Edward William Dziato
Samuel Grayson Eddy
Robert Henry Emwiler
Joseph Charles Gilliam
John William Glover
Charles Major Goetz
Francisco deAssis Grieco
Raymond Ralph Johnson
Philip Eugene Jones, Sr.
Timothy Joseph Kearns
William Henry Lanagan, Jr.
Charles Frederick Liebrecht
(With distinction)
Quenten Sheridan Looney
Eddie Mae Lucas
Leo Bernard Marx, Jr.

Va. Robert Francis Massimi
Fla. Robert Louis McNeely
Fla. R. Marathon Wirija Mihardja
Md. (With distinction)
Mass. Dale Marcell Molsberry
Calif. Sidney Rollins Overall, Jr.
Calif. (With distinction)
Texas Lloyd Spencer Penn
Ga. Joseph John Pessa
Ind. (With distinction)
Ohio Robert Floyd Peterson
Md. George Mark Richardson
Va. Walter Nick Roark, Jr.
Tenn. Joseph Gilpin Young Sanborn
Ohio Dale Wilson Scott
Va. John Charles Studt
Mass. (With distinction)
Va. Arthur Joseph Sullivan
Brazil Mary Jane Sullivan
N.Y. Ralph Edward Sullivan
Ga. Augustus Knowlton Taber, Jr.
Ill. Richard Alvord Ward
Md. (With distinction)
Va. Thomas Frank Wattle
Ala. John Wallace Webber
Mich. Donald Louis Werbeck
Fla. Dorsey Marvin White, Jr.
Jack Donald White
Richard Mead Woodward

Md.
Miss.
Indonesia
Fla.
Md.
Ark.
Pa.
Wash.
Miss.
Ark.
Utah
Ohio
Calif.
Iowa
Va.
Va.
D.C.
Calif.
Calif.
Wash.
Pa.
Va.
Mich.
Va.

MASTER OF ARTS

OCTOBER 22, 1960

Joseph Michael Avlio, Jr.
B.S. in B.A. 1957, Northeastern University
Graham Carson Beachum
A.B. 1960, The George Washington University

Fla. Harris Tagger Budoff
Va. B.S. in B.A. 1951, Bowling Green State University
Louis Alexander Caraplis
A.B. 1946, University of California at Los Angeles

Va.
Calif.

| | | | |
|---|-------|--|-------|
| Theodore Louis Cooper | Ohio | Joseph Cyril Missar | Pa. |
| A.B. 1953, The George Washington University | | B.S. 1938, Villanova University | Mich. |
| Meyer Arendt Edwards, Jr. | Va. | George Julius Nagy | |
| B.S. 1937, U. S. Military Academy | | A.B. in Govt. 1943, The George Washington University | S.D. |
| Lawrence Allen Herron | Va. | George Edwin Pinard | Maine |
| A.B. 1933, University of Kentucky | | A.B. 1937, University of South Dakota | Texas |
| Robert Leo Huber, Jr. | Pa. | John Dancy Richardson | Pa. |
| B.S. 1942, University of Scranton | | B.S. in B.A. 1953, University of North Carolina | |
| Dean Edward Hutter | Ill. | Lloyd Dee Ruth | |
| A.B. 1944, Coe College | | B.B.A. 1954, Hofstra College | Pa. |
| Louis Albert Kaufman, Sr. | Va. | Robert John Trout | |
| B.B.A. 1950, Loyola University | | B.S. 1936, U. S. Military Academy | Ohio |
| Harwood F. Means | Okla. | M.B.A. 1947, Harvard University | |
| A.B. 1960, The George Washington University | | A.M. 1953, Trinity University | |
| Gilbert Edgar Meyer | Ill. | Trevor Eifer Williams | |
| B.S. 1955, University of Maryland | | B.S. in Ed. 1956, University of Georgia | |

FEBRUARY 22, 1961

| | | | |
|---|--------|---|-------|
| Richard Craig Applegate | N.J. | George Murray McGee | Pa. |
| B.S. 1954, Oregon State College | | A.B. 1935, St. Joseph's College | N.Y. |
| Allan Henry Curry | Mich. | James Owen McKenna | Texas |
| A.B. 1948, Michigan State University of Agriculture and Applied Science | | A.B. 1957, Creighton University | |
| Dona Harbison Hildebrand | D.C. | Oliver Clark Ward | Texas |
| A.B. 1947, University of Colorado | | B.S. 1946, Louisiana State University and Agricultural and Mechanical College | |
| B.S. in Mil.Sc. 1957, University of Maryland | | David Hilton Watts | |
| William Charles Joslyn | N.Y. | B.S. 1936, Stephen F. Austin State Teachers College, Texas | Va. |
| B.Adm.E. 1939, Syracuse University | | Earle Melvin Welch, Jr. | |
| James Walter Mariner | Calif. | B.S. in B.A. 1950, University of Rhode Island | |
| A.B. 1958, University of Redlands | | | |
| Raymond Marsh, Jr. | Md. | | |
| B.S. in Com. 1949, The Citadel | | | |

JUNE 7, 1961

| | | | |
|--|--------|--|-------|
| Byron Demetrios Athan | Calif. | Robert Henry Kelly | Mich. |
| B.S. 1940, LL.B. 1947, University of San Francisco | | A.B. (CGS) 1961, The George Washington University | W.Va. |
| Godfrey Richard Baldwin | Va. | Robert Alexander Kincaid | |
| B.S. 1954, Virginia Polytechnic Institute | | B.S. 1938, Hampden-Sydney College | |
| Victor Cokayne Benjovsky | Colo. | LL.B. 1954, LL.M. 1958, The George Washington University | Va. |
| B.S. 1951, U. S. Naval Academy | | Glenn Arnold Lee | Co. |
| Joseph Aloysius Bodek | Calif. | B.B.A. 1956, University of Georgia | |
| Ed.B. 1959, Municipal University of Omaha | | John Robert Lipscomb | Iowa |
| John Frank Burgess, Jr. | Ala. | B.S. 1958, University of Maryland | |
| B.S. 1941, Auburn University | | Robert John MacLean | Co. |
| Ray Thomas Crane | Va. | A.B. 1936, State University of Iowa | |
| B.S. in Agr. 1948, University of Missouri | | Jane Meadow | Va. |
| Richard Segrave Daly | Pa. | A.B. 1952, University of Alabama | |
| A.B. 1955, Villanova University | | Bert Mogin | Mass. |
| Mario Petro D'Ambrosio | Va. | B.S. 1939, College of the City of New York | |
| B.S. 1956, D. C. Teachers College | | Patrick Hugh Rafferty | Va. |
| Earl Ruhl DeLong | Pa. | B.S. 1953, University of Maryland | |
| B.S. in Mil.Sc. 1959, University of Maryland | | Samuel LaFayette Reid | Va. |
| Edward Peter Dupras, Jr. | R.I. | B.S. 1941, The Citadel | |
| A.B. 1940, Providence College | | George Champion Ruffin, Jr. | Va. |
| Francis Edmund Flanagan | Va. | B.S. 1934, U. S. Naval Academy | |
| B.S. 1951, University of Maryland | | Mortimer Russell | Conn. |
| Wendell Graham | Va. | A.B. 1947, Brooklyn College | |
| B.S. in B.A. 1955, University of South Carolina | | Henry Willard Seely, Jr. | Va. |
| Bill Edwin Horner | Calif. | A.B. 1939, Amherst College | |
| A.B. in Mil.Sc. 1958, San Diego State College | | William Austin Shoner | Ill. |
| Nathan B. Hughes, Jr. | Md. | B.S. 1941, U. S. Naval Academy | |
| A.B. 1954, University of Maryland | | James Charles Skaggs | N.C. |
| Paul Allen Hynes | Md. | B.S. 1958, University of Maryland | |
| A.B. in Govt. 1958, The George Washington University | | Clyde Spruill Smithson, Jr. | Iowa |
| Samuel T. Jacks | Maine | A.B. 1950, University of North Carolina | |
| A.B. 1959, Colorado College | | Harvey Edward Spielman | Pa. |
| William Edward John | Ariz. | A.B. 1947, Parsons College | |
| B.S. 1938, University of Nebraska | | Murray Lacey Thompson | Va. |
| | | B.S. 1941, U. S. Naval Academy | |
| | | William Lee Williams | |
| | | B.S. in B.A. 1959, Youngstown University | |

MASTER OF ARTS IN INTERNATIONAL AFFAIRS

JUNE 7, 1961

| | | | |
|---|-------|---|-------|
| Thomas Law Bryan A.B. 1940, University of Oklahoma | Okla. | John Buchanan Stockton B.S. 1943, U. S. Military Academy | Kans. |
|---|-------|---|-------|

MASTER OF BUSINESS ADMINISTRATION

JUNE 7, 1961

| | | | |
|--|-------|---|------|
| Jack Calvin Berger B.S. in Mil.Sc. 1939, University of Maryland | Texas | Stanley Michael Matelski, Jr. B.S. 1941, Pennsylvania State University | Va. |
| Edgar Alvin Crumb A.B. (CGS) 1939, The George Washington University | Va. | Charles Edward Robertson B.S. 1933, U. S. Naval Academy | Fla. |
| William Jonse Hughes, Jr. B.S. 1940, U. S. Naval Academy | N.J. | Kenneth Walter Schultz B.Aero.E. 1931, New York University | N.Y. |
| Walter Philip Leber B.S. in Mining Pet. 1940, Missouri School of Mines and Metallurgy | Mo. | | |

THE GRADUATE COUNCIL

DOCTOR OF PHILOSOPHY

FEBRUARY 22, 1961

| | | | |
|--|-----|---|-------|
| Aaron David Alexander B.S. 1938, College of the City of New York M.S. 1953, The George Washington University | Md. | Ernest Frederick Zimmerman B.S. in Phar. 1956, M.S. 1958, The George Washington University | Mass. |
| DISSERTATION: "The Presence of a Soluble Hemolysin in Cultures of Pathogenic <i>Leptospiras</i> " | | DISSERTATION: "Studies on the Mechanism of Action of Some Pyrazolo (3, 4-d) Pyrimidines on <i>Escherichia coli</i> and <i>Bacillus cereus</i> " | |
| Edward Samuel Kline A.B. 1948, University of Pennsylvania M.S. 1955, The George Washington University | Va. | | |
| DISSERTATION: "Studies on a Succinoxidase Inhibitor from <i>Hydra</i> " | | | |

JUNE 7, 1961

| | | | |
|--|-------|---|-------|
| Muniswamappa Basavaraju B.S. 1947, Central College, Bangalore, India M.B.B.S. 1932, Medical College, Mysore, India | India | Nick Alexander Komons A.B. 1951, Marshall College A.M. 1955, The George Washington University | W.Va. |
| DISSERTATION: "The Responses of Single Units in the Olfactory Bulb to Odors" | | DISSERTATION: "Chicago, 1893-1907: The Politics of Reform" | |
| Lee Roy Brown, Jr. B.S. 1950, University of Alabama M.S. 1956, The George Washington University | Md. | Darwin Johnson Prockop A.B. 1951, Haverford College Hon. B.A. 1953, Oxford University, England M.D. 1956, University of Pennsylvania | D.C. |
| DISSERTATION: "Diffusion of Microbial Growth Factors Through Human Teeth and Its Effect on <i>In vitro</i> Dental Caries" | | DISSERTATION: "Studies on the Metabolism of Collagen Making Use of New Procedures for the Determination of Hydroxyproline" | |
| Victor Hugo Cohn, Jr. B.S. 1952, Lehigh University A.M. 1954, Harvard University | Md. | Selig Starr A.B. 1940, Brooklyn College A.M. 1951, The George Washington University | Md. |
| DISSERTATION: "Methods for the Micro-fluorometric Determination of Histamine and Arginine and Their Use in a Study of Mammalian Diamine Oxidase" | | DISSERTATION: "Some Algebraic Aspects of the Analysis of Variance" | |
| William Francis Flynn B.S. 1953, John Carroll University A.M. 1957, Catholic University of America | Ohio | John Miller Van Buren A.B. 1944, Dartmouth College M.D. 1947, Columbia University M.S. 1950, McGill University | Md. |
| DISSERTATION: "A Comparative Study of Verbal Clustering in Normal and Mentally Retarded Children" | | DISSERTATION: "The Retinal Ganglion Cell Layer" | |
| Julian Norman Kanfer B.S. 1954, Brooklyn College M.S. 1958, The George Washington University | Md. | | |
| DISSERTATION: "Intermediary Metabolism of L-Ascorbic Acid as Studied in Purified Mammalian Enzyme Systems" | | | |

HONORARY DEGREES

FEBRUARY 22, 1961

Oswald Symister Colclough—*Doctor of Science*

MAY 3, 1961

John Fitzgerald Kennedy—*Doctor of Laws*

JUNE 7, 1961

Galloway Calhoun—*Doctor of Laws*
Frank Atherton Howard—*Doctor of Science*
Mary Howe—*Doctor of Music*
Agnes Ernst Meyer—*Doctor of Social Science*

George Romney—*Doctor of Commercial Science*
Luther Andrew Smith—*Doctor of Laws*
James Edwin Webb—*Doctor of Laws*

RECIPIENTS OF AWARDS

1960-61

SCHOLARSHIPS

- The Russell W. Allen Scholarship:* Timothy W. Mead
The Alpha Zeta Omega Scholarship: Roberta Sandra Matthews
The Alumni Scholarships: Richard Allen, Steven Z. Kahn, William Michaels, Ronald Pump, Paul Schwab
The American Foundation for Pharmaceutical Education Scholarships: Sister Maria Philip Hornung, Myron Holly Winget
The American Legion Auxiliary Scholarship: Sandra Boorstein
The Byron Andrews Scholarship: Eileen Ann Wishner
The Association of Federal Communications Engineers Scholarship: Kitt E. Gilliland
The Anna Bartsch Scholarship: Violet Bowen
The Everett Lamont Bradley Scholarship: Allen Mendel Mondzac
The Albert and Alma Hand Britten Scholarships: John R. Calarco, Richard L. Cohen, Donald W. Evick, Robert B. Hirsch, Ashak Kalelkar, Joong Suk Lee, David L. Prisaznick, William R. Sangrey, Walter G. Santilli, Charles A. Thomas, Louis P. Wagman
The Emma K. Carr Scholarships: Frederick A. Bode, Martin J. Gersten, Leslie A. Hubbard, Lawrence T. Lobl, Stephen H. Mandy, Timothy D. Mead, Mendel L. Peterson, Jr., Martin V. Reece, Lawrence H. Shaw, Juris Simanis
The Henry Harding Carter Scholarship: Howard Thiebout Hill
The Maria M. Carter Scholarship: Kenneth Wai Yee
The Columbian Women Scholarships: Sylvia R. Appleton, Joan Frances Berberich, Dulcey A. Brown, Constance Campbell, Barbara J. Englander, Lilien Filipovitch, Brenda C. Flam, Suzanne Kirsch, Barbara Kline, Rhona L. Pavis, Linda E. Pearlstein, Rose Popovitch, Judith Rosenberg, Thelma R. Smackey, Eileen Jo Weppner
The Crown Photo Scholarship: Richard Jay DeNeale
The Daughters of the American Revolution Scholarship: Cynthia Mason Rhodes
The Isaac Davis Scholarship: Ann Wendell Thompson
The Delta Delta Delta Scholarship: Rhoda Baynard Miller
The District of Columbia Pharmaceutical Association Scholarship: Chester Leroy Wilson
The Estella Constance Drane Scholarship: Mary E. Musselman
The School of Engineering Scholarships: James P. Hansen, Reginald S. Mitchell, Robert E. Pulfrey, Charles A. Thomas
The Henry Parsons Erwin Scholarship: Paul Albert Oscar
The Robert Farnham Scholarship: Marcia S. Kirsch
The Esther Brigham Fisher Scholarship: Judith Hesse Posner
The General Motors Scholarships: John Gorden Day, John Pierce Donley, Gerald Allen Harden, Joyce Judson Ormsby
The Grants-in-Aid Scholarships: Joseph Adamitis, Nicholas R. Anzelmi, Donald B. Ardell, Robert Armstrong, Robert J. Barbieri, Robert G. Barnes, Stephen J. Bartnicki, William D. Blasingame, Clifford G. Botyos, Edgar O. Bowers, William F. Brzezinski, Frank Campana, John R. Caracciolo, Frank W. Cawood, Michael Checkers, Ronald Cindrich, Joseph G. Coniglio, Warren N. Corbin, Douglas Crupper, Gerald N. DePalma, Louis DeSimone, John A. Dezio, Richard R. Drummond, Francis X. Duda, Richard L. Duenkel, Jon Feldman, Anthony Fredicine, Desmond F. Gatti, Thomas J. George, Frank M. Goeltz, Alan Green, Andrew Guida, Arthur Gulitosa, Leonard B. Gunsior, Thomas G. Haly, Robert L. Haney, Edward E. Hardin, Harvey R. Harrison, Joel R. Hedetniemi, Joseph P. Heilman, Michael Herron, Dennis W. Hill, Merwin W. Holland, Charles Hornfeck, Richard J. Hornfeck, James Hrabousky, William H. Ingram, James Johnson, John Kasprzak, William C. Keys, Eric A. Lewis, Walter J. Ligenza, Robert J. K. Lukomski, Michael Mullen, Paul J. Munley, Richard Myers, Charles D. Packan, Donald R. Palmer, William R. Pashe, Frank B. Passaglia, John Pileonis, Rudy Pohl, Leon T. Pollock, Eugene Posati, Charles B. Reed, Ronald K. Reeves, Garland R. Schweickhardt, Cary Scollick, Franken Sherry, Kenneth Silverstone, Jerome S. Smalara, Albert H. Snyder, Alexander G. Sokaris, Peter R. Sommer, David R. Sparks, George G. Stone, Jr., Morris J. Sutter, Elliott C. Swift, Robert M. Tilker, James M. Tricollis

Lawrence Usiskin, Koert Vandervoort, Peter Wasilewski, John A. White, James Whitehead, Harry L. Wickline, Ellis B. Wisler, Jr., John C. Wrenn, Louis N. Yazich, Jr., Rudolph Zieger, Jr.

The Anna Spicker Hompel Scholarship: Eileen Jo Weppner

The Elma Lewis Harvey Scholarship: Joan Lee Smith

The Hazelton Scholarship: Joan Frances Berberich

The High School Scholarships: Francis W. Bode, Thomas A. Cabarga, Richard L. Cohen, Mary L. Cross, Richard O. Cunningham, Robert N. DeAngelis, Norman A. Eisenberg, Francis A. Farmer III, William Erwin Fredenberger, Jr., Sheila H. Graham, Jane Halperin, James P. Hansen, Priscilla Ann Hardin, Maureen I. Harris, Michael M. Hart, Elliott Hinkes, Peter Kern, Frances Louise Lee, Harold A. Levy, George Everett Long, Mary E. Maddox, Harold E. Marshall, Alice M. Martinson, Reginald S. Mitchell, Patsy Anne Morgan, Mary E. Musselman, Jesse E. Nolph, Bland Nelson Phelps, Constance E. Phillips, Robert E. Pulprey, David Lewis Prisaznick, Nancy Rosenberg, William Sangrey, Sandra Schwartz, Kenneth D. Taylor, Charles A. Thomas, Mary Louise Thomas, Louis Paul Wagman, Sharon Lee Wolfe, Mildred E. Wrenn, Faye Jing Yee

The Kappa Alpha Theta Scholarship: Marcia Coppel

The Kappa Psi Scholarship: Arthur Paul Herrmann, Jr.

The Law School Scholarships: Shirle A. Debenham, William Lee Dickey, James P. Grefory, Carter C. Hubbel, Jr., Jonathan Johnson, James A. Kenney, Martin M. Krawiec, John M. Larson, James E. Lemert, John C. Lyons, Charles L. Marinaccio, Daniel Sachs, James C. Schultz, Raymond S. Smethurst, Jr., John Rogers Stafford, William J. Swartz, William E. Watson

The Eugene and Agnes E. Meyer Scholarships: Sandra J. Clements, Allen B. Cohen, Irene F. Cunin, Barbara J. Englander, Alan P. Hawkins, Sidney W. Lowery, Jeannette Murphy, Zaida Newell, Carol Ann Nyquist, Janet Marie Pierson, Floyd C. Plowman, Jr.

The Newspaper Scholarships: Robert Alden, Mark Baldwin, Calvin D. Cramer, Thomas F. Dimond, Robert O'Connor, Mary Oldshine, James Threatte, Ward D. Wright

The Panhellenic Association of Washington, D. C. Scholarship: Carol V. Itschner

The Paul Pearson Scholarship: Thomas Victor Fuller

The Phi Delta Delta Scholarship: Cora Emma Weeks (1959-60)

The Phi Delta Gamma Scholarship: Letty Katz

The Lula M. Shepard Scholarship: Jean M. Myera, Judith G. Wheelus

The David M. Spencer Scholarship: Joseph Luther Arbena

The Mary Lowell Stone Scholarship: Mary-Stuart Gaskill

The Tau Kappa Epsilon Scholarship: Alan Price Hawkins

The Texaco Scholarship: Herbert Swann Wilkinson II

The John Withington Scholarship: Eng C. Wang

The Ellen Woodhull Scholarship: David Louis Dunner

The Zonta Club of Washington, D. C. Scholarship: Arlene Marian Kevorkian

PRIZES

1960-61

Alpha Chi Sigma Freshman Awards in Chemistry: Richard Charles Allen, Alan Stanley Green, Louis Charles Adamo

Alpha Chi Sigma Senior Award in Chemistry: Charles David Keilin

Alpha Delta Pi Award in Scholarship and Leadership: Joyce Judson Ormsby

Alpha Kappa Psi Award in Commerce: Harold Eugene Manley

Alpha Zeta Omega Award in Pharmacy: Richard Charles Allen

American Institute of Chemists Award in Chemistry: Charles David Keilin

American Pharmaceutical Association Award in Pharmacy: Estelle Deborah Luber

Norman B. Ames Memorial Award in Engineering: Herbert Swann Wilkinson II

Martin L. Cannon Memorial Award in Pharmacy: Barbara Ann Baker

Chi Omega Award in Social Sciences: Adelaide Priscilla Itscoitz

Columbian Women Award to the graduating senior woman who in her undergraduate life has most nearly fulfilled the objectives of Columbian Women: Cynthia Mason Rhodes

John Henry Cowles Awards in Government: Stanley David Heckman, William Thomas Daly

- DeWitt Clinton Croissant Award for an essay on drama or the theater:* Dorothy Katharine Marshall
- E. K. Cutter Award in English:* Francis Raymond McGlynn
- Isaac Davis Awards in Public Speaking:* Stanley David Heckman, Elaine Barbara Cohen, Clare Elizabeth Calvert
- Delta Gamma Award for scholarship, extracurricular activities, and service to the University:* Dorothy Sandra Cain
- Delta Zeta Award in Zoology:* Mary Alice Heller
- Elton Award in Greek:* Jeanne Antonopoulos Roode
- School of Engineering Distinguished Scholar to the senior who graduates with the highest scholastic standing:* Thomas John Golab
- Jesse Frederick Essay Award to that student who has given promise of sound citizenship and ability in "forthright reporting":* Roger Winship Stuart II
- Joshua Evans III Memorial Award to that man in the graduating class who has demonstrated his signal ability in the social and political sciences and who has given promise of the interpretation of that ability in good citizenship among his fellows:* William Thomas Daly
- Willie E. Fitch Memorial Award in Chemistry:* Charles David Keilin
- Allie S. Freed Award to that member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Preventive Medicine:* Allen Mendel Mondzac
- Charles Glover Award to that student in the Law School who has attained the highest average grade in the third-year, full-time course:* Janet Goldrich Kohn
- Alice Douglas Goddard Award in American Literature:* Daniel Yost Gilham
- Edward Carrington Goddard Award in French:* Rhoda Baynard Miller
- James Douglas Goddard Award in Pharmacy:* Morton Keroes Hyman
- Morgan Richardson Goddard Award in Commerce:* Harold Eugene Manley
- Alec Horwitz Award to the senior in the School of Medicine who has demonstrated exceptional proficiency in the field of Surgery:* Robert Scott Schull
- Gardiner G. Hubbard Memorial Award in United States History:* John William Boettjer
- Kappa Beta Pi Award to the woman law student in the freshman class who attains the highest average for the freshman year:* Cora Emma Weeks (1959-60)
- Kappa Kappa Gamma Award in Botany:* Jane E. Halperin
- John Bell Larner Award to that member of the graduating class of the Law School with the highest scholastic standing:* Janet Goldrich Kohn
- Huron W. Lawson Award in Obstetrics and Gynecology:* John Lloyd Marlow
- Martin Mahler Award in Materials Testing:* Aubrey Jackson Stringer
- Mortar Board Award to the woman student in the Sophomore Class having a scholastic standing of B or higher and the most outstanding record in activities:* Linda Carol Nusbaum
- Julius S. Neviasser Award in Orthopedic Surgery:* Edward A. Janon
- Omicon Delta Kappa Award to that member of the Senior Class who, throughout his course, has done the most constructive work in student activities:* Roger Winship Stuart II
- John Ordranax Awards to the first- and second-year full-time students in the Law School who have attained the highest average grades:* Thomas Akroyd Clingan, Jr., Janet Goldrich Kohn (1959-60)
- John Ordranax Award to that member of the graduating class of the School of Medicine with the highest scholastic standing:* Allen Mendell Mondzac
- Phi Eta Sigma Award to the beginning male student attaining the highest scholastic average in his first full semester of work:* Francis William Bode
- Pi Beta Phi Award to that member of the Senior Class who, throughout her course, has done the most to promote student activities:* Cynthia Mason Rhodes
- Pi Lambda Theta Award in Teacher Education:* Shirley Manheim Hennes
- Psi Chi Awards in Psychology:* Routh Nash Coffman, Regis Hills Walther
- Rugles Award in Mathematics:* Richard Kelly Oliver
- Sigma Kappa Award in Chemistry:* Byron Torwelle Backus
- Staughton Award in Latin:* Christine Edda Verdross
- James MacBride Sterrett, Jr., Award in Physics:* Richard Steven Weissberg
- Charles Clinton Swisher Historical Club Award in Medieval History:* Sandra Jean Clements
- Thomas F. Walsh Award in Irish History:* Elena Talcott Constantinople

STUDENT ASSISTANTS

JUNE 1, 1960 TO JUNE 1, 1961

- Accounting:* Joan Grubbs, Nancy Keim, Harold Eugene Manley, Merritt Lee Murray, Michael Perper, Andrew Potts, Marvin Singman, Constantine Tseronis
- Art:* Elizabeth Beasley Del Donna, Lucinda Ann Hanna
- Biology:* Marilyn Louise Cass, Edith Heflin, Evangelos Damianos Karandreas, Karen Sue Klenke, Charles Dinwiddie Stores
- Botany:* Elizabeth Corinne Bailey, Rebecca Hilliard Gettens, John Marshall, Michael Toole
- Business and Public Administration:* Julia Hinebaugh, Bruce Franklin Norton, James Kenneth Palmer (A.B.), Marlene Merle Silverman
- Chemistry:* Stephen Gordon, Charles David Keilin, George Wilner
- Civil Engineering:* Nancy Dudwick, Alfred Johnson, Robert Sanford (fall)
- Dramatic Activities:* Ellen Ahr
- Economics:* David Ernest Aaronson, Judith Ellen Crumlish, Anita Dasbach (A.B.)
- Education:* John Diggs (A.M.), George Foster (A.M.), David Iwamoto, Henry Edward York
- Electrical Engineering:* Michael Cogan, Kitt Earl Gilliland, Daniel Havens, Jhong Lee (B.S. in E.E.), Donald Lokerson, Raphael Vincent Lupo, Deane Parker, George Oscar Selz (B.S.), William Smith
- Engineering Administration:* Caroline Hauptmann, Vorachon Singhaumalee
- English:* Sharon Lee Glenn (A.B.), Marjorie Martin, Eileen Scott, Joan Smith
- Geography:* David Lyndle Ames, Eldon Miller
- Geology:* George Rabchevsky (B.S.), Andrew Stancioff, Robert McLean Turner
- History:* Merle David Baumgart (A.B.), Jared Bradley (A.M.), Elena Talecott Constantino, Elvin Heilberg (M.S.), Maizie Harrison Johnson (Ed.B.), Patricia Jo Murphy, Virginia Cardwell Purdy, Donald Stewart (A.M.)
- Law:* Janet Goldrich Kohn (A.B.), James Edwin Lemert (B.S. in E.E.), Daniel Sachs (B.S.), James Clement Schultz (B.S.), Raymond Stevens Smethurst, Jr. (B.M.E.)
- Mathematics:* Helen Low, Mal Hee Son (A.B.)
- Mechanical Engineering:* Partap Chander, Lawrence Denison, Jr., Daniel Mulville, Robert Sanford (spring)
- Pharmacy:* Arthur Paul Herrmann, Jr.
- Philosophy:* Stuart Lee Kaplan
- Physical Education for Men:* Gene Beverly, Raymond Black, John Donley, Patricia Martin, Daniel Solt, Woodbury Weimern, Barry Young
- Physics:* William Albert Schmidt
- Political Science:* Linda Brandenburger (A.B.), Sandra Bregman, Alvin Capp, Dorothy Jeanne Carlson, Carol Ann Edwards, Stanley David Heckman, Thomas Page Johnson (A.B.), Charles Landon, Timothy Dean Mead
- Psychology:* George Beach, Francis Thomas Curtis, Barbara Epstein, Lyndall Johnson, Bernard Karmel, Ann Kellogg, George Oscar McClary (M.S.), Lourdes Ortega, Marcia O'Shea, Joanne Parker, Mary Parsons Perkins, Anna Scott, Donald Alan Stubbs, Harvey Wertlieb
- Religion:* Stephanie Carol Patchen
- Romance Languages:* Marc Elie McClure, George Johann Zumpf
- Secretarial Studies:* Joan Elizabeth Luks, Helen Santos
- Sociology and Anthropology:* Julian Bartolini, Caroline McDougal Bierer (A.B.), Sue Hyde Dodge, Nancy Jean Hanks, Jackwell Susman
- Speech:* Harold Louis Boerlin II, Rolande Fleurette Boucher, Joyce May Davis, Mollie Ann Harper, Karlota Marie Koester, Seamon Richard Lippman
- Statistics:* Karen Louise Dreier, Susan Kinnemann, David Moss, Hugh Pettigrew (B.S.), Allen Singer, Helmut Thiess, Thomas Clair Varley, Brian McCaslin Williams (A.B.)
- Zoology:* Anthony Parke Avery, John David Clough, Ray Frederick Crist, Edward Der Martirosian, David Louis Dunner, John Garrison, Michael Roy Herron, Barbara Johnson, Dona Burnett Marler, William Angus Muir (B.S.), Sara Thornton Noe (B.S.), William Warden, Robert Marion Wilson (B.S.)

SUMMARY OF REGISTRATION

1960-61

JUNIOR COLLEGE

| | Men | Women | Total |
|---------------------|-------|-------|-------|
| Fall Semester: | | | |
| Undergraduate | 1,005 | 848 | 1,853 |
| Spring Semester: | | | |
| Undergraduate | 905 | 801 | 1,706 |

COLUMBIAN COLLEGE

| | | | |
|---------------------|-----|-----|-------|
| Fall Semester: | | | |
| Undergraduate | 339 | 350 | 689 |
| Graduate | 308 | 176 | 484 |
| Unclassified | 16 | 9 | 25 |
| Total | 663 | 535 | 1,198 |
| Spring Semester: | | | |
| Undergraduate | 319 | 325 | 644 |
| Graduate | 280 | 170 | 450 |
| Unclassified | 12 | 8 | 20 |
| Total | 611 | 503 | 1,114 |

THE GRADUATE COUNCIL

| | | | |
|---------------------------|-----|----|-----|
| Fall Semester: | | | |
| Doctor of Philosophy..... | 164 | 35 | 199 |
| Spring Semester: | | | |
| Doctor of Philosophy..... | 174 | 39 | 213 |
| Unclassified | 3 | 2 | 5 |
| Total | 177 | 41 | 218 |

THE SCHOOL OF MEDICINE

| | | | |
|-------------------------|-----|----|-----|
| Fall Semester: | | | |
| Doctor of Medicine..... | 366 | 22 | 388 |
| Spring Semester: | | | |
| Doctor of Medicine..... | 366 | 22 | 388 |

THE LAW SCHOOL

| | | | |
|--|-------|----|-------|
| Fall Semester: | | | |
| Bachelor of Laws and Juris Doctor..... | 990 | 52 | 1,042 |
| Graduate | 32 | 2 | 34 |
| Unclassified | 21 | 1 | 22 |
| Total | 1,043 | 55 | 1,098 |
| Spring Semester: | | | |
| Bachelor of Laws and Juris Doctor..... | 886 | 43 | 929 |
| Graduate | 34 | 3 | 37 |
| Unclassified | 22 | — | 22 |
| Total | 942 | 46 | 988 |

THE SCHOOL OF ENGINEERING

| Fall Semester: | Men | Women | Total |
|---------------------|-------|-------|-------|
| Undergraduate | 538 | 12 | 550 |
| Graduate | 567 | 4 | 571 |
| Unclassified | 41 | 4 | 45 |
| Total | 1,146 | 20 | 1,166 |
| Spring Semester: | | | |
| Undergraduate | 503 | 10 | 513 |
| Graduate | 536 | 2 | 538 |
| Unclassified | 51 | 1 | 52 |
| Total | 1,090 | 13 | 1,103 |

THE SCHOOL OF PHARMACY

| Fall Semester: | | | |
|---------------------|----|---|----|
| Undergraduate | 22 | 6 | 28 |
| Unclassified | — | 1 | 1 |
| Total | 22 | 7 | 29 |
| Spring Semester: | | | |
| Undergraduate | 26 | 6 | 32 |

THE SCHOOL OF EDUCATION

| Fall Semester: | | | |
|---------------------|-----|-----|-----|
| Undergraduate | 56 | 155 | 211 |
| Graduate | 266 | 276 | 542 |
| Unclassified | 26 | 33 | 59 |
| Total | 348 | 464 | 812 |
| Spring Semester: | | | |
| Undergraduate | 59 | 147 | 206 |
| Graduate | 263 | 264 | 527 |
| Unclassified | 21 | 37 | 58 |
| Total | 343 | 448 | 791 |

THE SCHOOL OF GOVERNMENT, BUSINESS, AND INTERNATIONAL AFFAIRS

| Fall Semester: | | | |
|---------------------|-----|-----|-----|
| Undergraduate | 207 | 65 | 272 |
| Graduate | 443 | 41 | 484 |
| Unclassified | 16 | 3 | 19 |
| Total | 666 | 109 | 775 |
| Spring Semester: | | | |
| Undergraduate | 198 | 54 | 252 |
| Graduate | 448 | 41 | 489 |
| Unclassified | 16 | 1 | 17 |
| Total | 662 | 96 | 758 |

COLLEGE OF GENERAL STUDIES CAMPUS DIVISION*

| Fall Semester: | | | |
|---------------------|-----|----|-----|
| Undergraduate | 70 | 14 | 84 |
| Graduate | 40 | 23 | 63 |
| Unclassified | 39 | 6 | 45 |
| Total | 149 | 43 | 192 |

* Off-Campus Division: credit courses, 7,073; noncredit courses, 408; TV noncredit courses, 520; radio noncredit courses, 202; total 8,203.

Summary of Registration

361

| Spring Semester: | Men | Women | Total |
|---------------------|-----|-------|-------|
| Undergraduate | 75 | 13 | 88 |
| Graduate | 96 | 2 | 98 |
| Unclassified | 41 | 1 | 42 |
| Total | 212 | 16 | 288 |

THE DIVISION OF UNIVERSITY STUDENTS

| | | | |
|---------------------------|-------|-----|-------|
| Fall Semester: | | | |
| University students | 1,187 | 760 | 1,947 |
| Spring Semester: | | | |
| University students | 943 | 679 | 1,622 |

THE DIVISION OF SPECIAL STUDENTS

| | | | |
|---------------------|-----|-----|-----|
| Fall Semester: | | | |
| Undergraduate | 215 | 72 | 287 |
| Graduate | 81 | 23 | 104 |
| Unclassified | 107 | 28 | 135 |
| Total | 403 | 123 | 526 |
| Spring Semester: | | | |
| Undergraduate | 196 | 73 | 269 |
| Graduate | 82 | 22 | 104 |
| Unclassified | 97 | 25 | 122 |
| Total | 375 | 120 | 495 |

SUMMARY

| | | | |
|---------------------|-------|-------|--------|
| Fall Semester: | | | |
| Undergraduate | 2,452 | 1,522 | 3,974 |
| Graduate | 3,257 | 654 | 3,911 |
| Unclassified | 1,453 | 845 | 2,298 |
| Total | 7,162 | 3,021 | 10,183 |
| Spring Semester: | | | |
| Undergraduate | 2,281 | 1,429 | 3,710 |
| Graduate | 3,165 | 608 | 3,773 |
| Unclassified | 1,206 | 754 | 1,960 |
| Total | 6,652 | 2,791 | 9,443 |

SUMMER SESSIONS 1960

| | | | |
|---------------------------|-------|-------|-------|
| Students registered | 2,573 | 1,483 | 4,056 |
|---------------------------|-------|-------|-------|

TEACHING STAFF 1960-61

| | |
|--|-----|
| Professors Emeritus | 48 |
| Professors | 132 |
| Research Professors | 2 |
| Adjunct Professors | 5 |
| Professorial Lecturers | 74 |
| Clinical Professors | 23 |
| Associate Professors | 76 |
| Associate Clinical Professors | 26 |
| Associate Research Professor | 1 |
| Associate Professorial Lecturers | 51 |
| Associates in the School of Medicine | 135 |

| | |
|---|-------|
| Assistant Professors | 71 |
| Assistant Clinical Professors | 90 |
| Assistant Research Professors | 5 |
| Lecturers | 111 |
| Instructors | 24 |
| Clinical Instructors | 166 |
| Associates | 59 |
| Fellows in the School of Medicine | 48 |
| University Teaching Fellows | 20 |
| Graduate Teaching Assistants | 28 |
| Technicians | 17 |
| TOTAL | 1,212 |

DEGREES CONFERRED

1960-61

| | |
|---|-------|
| Advanced Professional Certificate (Education) | 11 |
| Associate in Arts (College of General Studies) | 60 |
| Associate in Arts (Junior College) | 424 |
| Associate in Science (College of General Studies) | 2 |
| Associate in Science (Junior College) | 1 |
| Bachelor of Arts (College of General Studies) | 82 |
| Bachelor of Arts (Columbian College) | 265 |
| Bachelor of Arts in Education | 96 |
| Bachelor of Arts in Government | 58 |
| Bachelor of Business Administration | 45 |
| Bachelor of Civil Engineering | 7 |
| Bachelor of Electrical Engineering | 31 |
| Bachelor of Laws | 209 |
| Bachelor of Laws (National University) | 1 |
| Bachelor of Mechanical Engineering | 18 |
| Bachelor of Science | 33 |
| Bachelor of Science in Engineering | 9 |
| Bachelor of Science in Home Economics | 4 |
| Bachelor of Science in Medical Technology | 2 |
| Bachelor of Science in Pharmacy | 17 |
| Bachelor of Science in Physical Education | 18 |
| Doctor of Business Administration | 2 |
| Doctor of Education | 1 |
| Doctor of Juridical Science | 1 |
| Doctor of Medicine | 95 |
| Doctor of Philosophy | 12 |
| Juris Doctor | 42 |
| Master of Arts (College of General Studies) | 65 |
| Master of Arts (Columbian College) | 60 |
| Master of Arts in Education | 133 |
| Master of Arts in Government | 28 |
| Master of Arts in International Affairs (College of General Studies) | 2 |
| Master of Arts in Personnel Administration | 14 |
| Master of Arts in Public Administration | 13 |
| Master of Business Administration (College of General Studies) | 7 |
| Master of Business Administration (School of Government, Business, and International Affairs) | 75 |
| Master of Comparative Law | 3 |
| Master of Engineering Administration | 31 |
| Master of Laws | 8 |
| Master of Science | 30 |
| Master of Science in Engineering | 8 |
| TOTAL | 2,023 |

**GEOGRAPHICAL DISTRIBUTION OF STUDENTS REGISTERED
FALL SEMESTER 1960-61**

UNITED STATES, TERRITORIES, AND POSSESSIONS

| | | | |
|----------------------------|-------|-------------------------|-------|
| Alabama | 29 | Nevada | 7 |
| Alaska | 5 | New Hampshire | 18 |
| Arizona | 14 | New Jersey | 205 |
| Arkansas | 16 | New Mexico | 18 |
| California | 150 | New York | 399 |
| Colorado | 18 | North Carolina | 67 |
| Connecticut | 59 | North Dakota | 10 |
| Delaware | 23 | Ohio | 109 |
| District of Columbia | 2,902 | Oklahoma | 21 |
| Florida | 77 | Oregon | 14 |
| Georgia | 31 | Pennsylvania | 307 |
| Hawaii | 15 | Rhode Island | 22 |
| Idaho | 30 | South Carolina | 30 |
| Illinois | 92 | South Dakota | 11 |
| Indiana | 55 | Tennessee | 35 |
| Iowa | 32 | Texas | 61 |
| Kansas | 31 | Utah | 32 |
| Kentucky | 20 | Vermont | 9 |
| Louisiana | 24 | Virginia | 2,655 |
| Maine | 27 | Washington | 32 |
| Maryland | 1,777 | West Virginia | 85 |
| Massachusetts | 96 | Wisconsin | 37 |
| Michigan | 69 | Wyoming | 6 |
| Minnesota | 23 | American Samoa | 1 |
| Mississippi | 13 | Panama Canal Zone | 2 |
| Missouri | 39 | Puerto Rico | 10 |
| Montana | 14 | Virgin Islands | 2 |
| Nebraska | 17 | | |

FOREIGN COUNTRIES

| | | | |
|---------------------------|---|------------------|----|
| Albania | 2 | Greece | 5 |
| Argentina | 5 | Haiti | 1 |
| Australia | 1 | Hungary | 2 |
| Austria | 1 | India | 19 |
| Belgium | 1 | Indonesia | 7 |
| Bolivia | 6 | Iran | 13 |
| Brazil | 3 | Iraq | 7 |
| British West Indies | 2 | Ireland | 2 |
| Bulgaria | 1 | Israel | 3 |
| Burma | 3 | Italy | 3 |
| Cambodia | 1 | Japan | 12 |
| Canada | 9 | Jordan | 4 |
| Chile | 3 | Korea | 18 |
| Colombia | 6 | Laos | 3 |
| Costa Rica | 1 | Lebanon | 5 |
| Cuba | 2 | Liberia | 1 |
| Czechoslovakia | 1 | Libya | 1 |
| Denmark | 1 | Mexico | 1 |
| Dutch Guiana | 1 | Micronesia | 2 |
| Ecuador | 2 | Morocco | 4 |
| Egypt | 1 | Nicaragua | 2 |
| England | 6 | Nigeria | 1 |
| Ethiopia | 1 | Norway | 1 |
| Formosa | 3 | Pakistan | 1 |
| France | 6 | Panama | 5 |
| Germany | 8 | Peru | 6 |

| | | | |
|-------------------------|----|----------------------------|---|
| Philippines | 15 | Turkey | 4 |
| Poland | 1 | United Arab Republic | 5 |
| Portugal | 1 | Venezuela | 2 |
| Republic of China | 10 | Viet Nam | 1 |
| Scotland | 2 | Yemen | 5 |
| Sweden | 3 | Yugoslavia | 4 |
| Thailand | 6 | Stateless | |

GEOGRAPHICAL DISTRIBUTION OF STUDENTS REGISTERED
SPRING SEMESTER 1960-61

UNITED STATES, TERRITORIES, AND POSSESSIONS

| | | | |
|----------------------------|-------|---------------------------------------|-------|
| Alabama | 27 | Nevada | 9 |
| Alaska | 5 | New Hampshire | 31 |
| Arizona | 19 | New Jersey | 199 |
| Arkansas | 14 | New Mexico | 21 |
| California | 152 | New York | 358 |
| Colorado | 21 | North Carolina | 58 |
| Connecticut | 54 | North Dakota | 8 |
| Delaware | 21 | Ohio | 105 |
| District of Columbia | 2,540 | Oklahoma | 20 |
| Florida | 70 | Oregon | 20 |
| Georgia | 36 | Pennsylvania | 298 |
| Hawaii | 13 | Rhode Island | 20 |
| Idaho | 29 | South Carolina | 27 |
| Illinois | 106 | South Dakota | 8 |
| Indiana | 50 | Tennessee | 35 |
| Iowa | 35 | Texas | 61 |
| Kansas | 29 | Utah | 32 |
| Kentucky | 20 | Vermont | 10 |
| Louisiana | 24 | Virginia | 2,367 |
| Maine | 26 | Washington | 32 |
| Maryland | 1,671 | West Virginia | 81 |
| Massachusetts | 100 | Wisconsin | 36 |
| Michigan | 63 | Wyoming | 5 |
| Minnesota | 22 | Panama Canal Zone | 3 |
| Mississippi | 12 | Puerto Rico | 10 |
| Missouri | 42 | Virgin Islands | 2 |
| Montana | 13 | Other United States Territories | 3 |
| Nebraska | 20 | | |

FOREIGN COUNTRIES

| | | | |
|---------------------------|---|------------------|----|
| Afghanistan | 1 | England | 8 |
| Argentina | 3 | Ethiopia | 1 |
| Bolivia | 8 | Formosa | 2 |
| Brazil | 4 | France | 7 |
| British West Indies | 5 | Germany | 9 |
| Bulgaria | 2 | Ghana | 1 |
| Burma | 4 | Gold Coast | 1 |
| Cambodia | 1 | Greece | 4 |
| Canada | 9 | Haiti | 1 |
| Chile | 3 | Hong Kong | 3 |
| Colombia | 7 | Hungary | 17 |
| Cuba | 3 | India | 10 |
| Czechoslovakia | 1 | Indonesia | 11 |
| Denmark | 1 | Iran | 6 |
| Dutch Guiana | 1 | Iraq | 2 |
| Ecuador | 5 | Ireland | 2 |
| Egypt | 1 | Israel | 2 |
| El Salvador | 1 | Italy | |

| | | | |
|-------------------|----|---------------------------------------|----|
| Japan | 12 | Poland | 2 |
| Jordan | 4 | Republic of China | 10 |
| Korea | 23 | Rumania | 1 |
| Lebanon | 2 | Scotland | 2 |
| Liberia | 1 | Sweden | 1 |
| Micronesia | 2 | Thailand | 4 |
| Morocco | 3 | Turkey | 5 |
| Netherlands | 3 | Union of Soviet Socialist Republics.. | 3 |
| Nicaragua | 1 | United Arab Republic | 5 |
| Nigeria | 1 | Venezuela | 2 |
| Norway | 3 | Viet Nam | 6 |
| Pakistan | 2 | Yemen | 1 |
| Panama | 4 | Yugoslavia | 4 |
| Peru | 3 | Stateless | 2 |
| Philippines | 14 | | |

ALUMNI AND ALLIED ASSOCIATIONS

THE GENERAL ALUMNI ASSOCIATION

The objectives of this Association are to unite the graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University.

Eligible members are those who have matriculated in any school of the University and who have left the University in good standing, or any person who is or has been a member of the teaching, research, or administrative staff of the University, or of the Board of Trustees of the University. Active members are those eligible members who are current contributors to or life members of The George Washington University General Alumni Association, the Alumni Associations of any school of the University, or contributors to the Alumni Fund.

The Alumni Office is in Bacon Hall, 2000 H Street NW., Washington 6, D. C.

All alumni are urged to keep the Alumni Office informed of changes of address or occupation and to supply information with regard to their fellow alumni.

1961-62

GOVERNING BOARD

President.—J. Frank Doubleday, A.M. (C.G.S.) 1955: 404 N. Kenmore Street, Arlington, Va.

Vice President.—John R. Busick, A.B. 1936: 61 N. Quaker Lane, Alexandria, Va.

Secretary.—Helen S. Stone, A.M. 1949, Ph.D. 1954: 2124 Eye Street NW., Washington, D. C.

Treasurer.—Donald W. Cole, M.B.A. 1957: 51 Louisiana Avenue NW., Washington, D. C.

Columbian College of Arts and Sciences:

John R. Busick, A.B. 1936: 61 N. Quaker Lane, Alexandria, Va.

Washington I. Cleveland, LL.B. 1923, A.B. 1926: 1712 G Street NW., Washington, D. C.

Graduate Council:

Helen M. Dyer, M.S. 1929, Ph.D. 1935: 3024 Tilden Street NW., Washington, D. C.

Helen S. Stone, A.M. 1949, Ph.D. 1954; 2124 Eye Street NW., Washington, D. C.

School of Medicine:

Frederick Y. Donn, M.D. 1941; 1835 Eye Street NW., Washington, D. C.

Donald H. Leeper, Jr., M.D. 1938; 1835 Eye Street NW., Washington, D. C.

Law School:

L. Jackson Embrey, A.B. 1937, LL.B., LL.M. 1949; 1437 N. Courthouse Road, Arlington, Va.

C. Jules Rose, A.B. 1942, LL.B. 1949; 1511 K Street NW., Washington, D. C.

School of Engineering:

James J. Crenca, B.E.E. 1955, M.E.A. 1959; 901 N. Columbus Street, Alexandria, Va.

Paul Kuzio, B.C.E. 1955; 3601 Van Ness Street NW., Washington, D. C.

School of Pharmacy:

F. Royce Franzoni, Jr., B.S. in Phar. 1936; 627 Pennsylvania Avenue NW., Washington, D. C.

William E. Pannill, B.S. in Phar. 1950; 2104 Marilyn Drive SE., Washington, D. C.

School of Education:

J. Dallas Shirley, B.S. in P.E. 1936, A.M. in Ed. 1945; 4409 N. Pershing Drive, Arlington, Va.

Abbie O. Smith, B.S. in P.E. 1953, A.M. in Ed. 1958; 315 Whitestone Road, Silver Spring, Md.

School of Government, Business, and International Affairs:

Donald W. Cole, M.B.A. 1957; 51 Louisiana Avenue N.W., Washington, D. C.

Thaddeus A. Lindner, A.B. in Govt. 1951; 2140 Pennsylvania Avenue NW., Washington, D. C.

College of General Studies:

Reginald D. Barta, A.B. (C.G.S.) 1958; 7420 Blackford Street, Arlington, Va.

J. Frank Doubleday, A.M. (C.G.S.) 1955; 404 N. Kenmore Street, Arlington, Va.

Faculty:

George M. Koehl, A.M. 1933; 515 Mansfield Road, Silver Spring, Md.

Frederick R. Houser, A.B. 1948, A.M. in Govt. 1950; 2141 Eye Street NW., Washington, D. C.

THE GEORGE WASHINGTON UNIVERSITY MEDICAL ALUMNI ASSOCIATION

The George Washington University Medical Association, the organization of graduates of the School of Medicine, was established in 1905 and since 1926 has been affiliated with the General Alumni Association. The objects of the Association, as stated in the constitution, are "to provide constructive services for the alumni of The George Washington University School of Medicine, for furthering the art and science of medicine, research, and for the promotion of the welfare of The George Washington University School of Medicine, its students, The George Washington University Hospital and its trainees."

1960-61

President.—Edward E. Ferguson, M.D. 1936; 1835 Eye Street NW., Washington, D. C.

President Elect.—Alfred E. Brigulio, M.D. 1936; 2025 Eye Street NW., Washington, D. C.

First Vice President.—Austin B. Rohrbaugh, Jr., M.D. 1941; 4422 East West Highway, Bethesda, Md.

Second Vice President.—Sally S. MacDonald, A.B. 1940, M.D. 1944; 10602 Dunkirk Drive, Silver Spring, Md.

Secretary.—Howard E. Ticktin, A.B. 1950, M.D. 1954; 10307 Leslie Street, Silver Spring, Md.

Treasurer.—Naomi M. Kanof, A.B. 1931, M.D. 1934; 1150 Connecticut Avenue NW., Washington, D. C.

Council:

J. Roscoe Greer, M.D. 1935; 900 17th Street NW., Washington, D. C.

Frederick Y. Donn, M.D. 1941; 1835 Eye Street NW., Washington, D. C.

Donald H. Leeper, Jr., M.D. 1938; 1835 Eye Street NW., Washington, D. C.

F. Turner Reuter, M.D. 1944; 1835 Eye Street NW., Washington, D. C.

George Speck, M.D. 1941; 2772 S. Randolph Street, Arlington, Va.

THE GEORGE WASHINGTON LAW ASSOCIATION

The George Washington Law Association, the organization of graduates of the Law School, was founded in 1912 and has been affiliated with the General Alumni Association since 1926. Its purposes as stated in the constitution are to promote high standards of legal education, to keep the alumni of the Law School in closer touch with one another and especially with members of their own classes, to gather and publish at intervals information as to the whereabouts and activities of these alumni, and to further the interests of the Law School.

1960-61

President.—Sam Houston, LL.B. 1936 (National University); 1710 H Street NW., Washington, D. C.

First Vice President.—Philbrick McCoy, LL.B. 1922, LL.M. 1923; The Superior Court, Los Angeles, Calif.

Second Vice President.—Charles R. Cutler, J.D. 1949; World Center Building, Washington, D. C.

Third Vice President.—Clair L. Stout, LL.B. 1938; Munsey Building, Washington, D. C.

Secretary.—Edwin S. Nail, LL.B. 1951; 1240 19th Street NW., Washington, D. C.

Treasurer.—Samuel J. L'Hommedieu, Jr., LL.B. 1951, LL.M. 1952; 729 15th Street NW., Washington, D. C.

Executive Committee:

Joel Barlow, LL.B. 1935; 701 Union Trust Building, Washington, D. C.

C. Oscar Berry, LL.B. 1932; 4324 43d Street NW., Washington, D. C.

Fontaine C. Bradley, LL.B. 1925; 701 Union Trust Building, Washington, D. C.

W. Cameron Burton, LL.B. 1921; Investment Building, Washington, D. C.

Geoffrey Creyke, Jr., LL.B. 1935; Washington Building, Washington, D. C.

Gordon W. Daisley, LL.B. 1933; 700 10th Street NW., Washington, D. C.

I. Jackson Embrey, LL.B., LL.M. 1949; 1437 N. Courthouse Road, Arlington, Va.

Elizabeth S. Freret, LL.B. 1950; 1625 K Street NW., Washington, D. C.

Joseph D. Hughes, LL.B. 1934; 525 William Penn Place, Pittsburgh, Pa.

Thomas S. Jackson, A.B. 1933, LL.B. 1935; 719 15th Street NW., Washington, D. C.

Arthur G. Logan, A.B. 1925, LL.B. 1926; Continental American Life Building,

Wilmington, Del.

- George E. Monk, LL.B. 1930, LL.M. 1934; Colorado Building, Washington, D. C.
 L. Karlton Mosteller, LL.B. 1924 (National University); 2712 First National Building, Oklahoma City 2, Okla.
 Bernard I. Nordlinger, LL.B. 1933; 419 Southern Building, Washington, D. C.
 James F. Perrin, LL.B. 1937 (National University); 2101 Connecticut Avenue NW., Washington, D. C.

THE LIBRARY SCIENCE ALUMNI ASSOCIATION

The Library Science Alumni Association was organized in 1932 by graduates of the Division of Library Science and became an affiliate of the General Alumni Association in 1935. It was established to foster a closer relationship between the Faculty and graduates and to further the interests of the Division of Library Science and of the University as a whole.

1961-62

- President.*—Betty Hill Reavis, A.B. 1933; Medical Library, St. Elizabeths Hospital, Washington, D. C.
Vice President.—Mary Louise Beitzell, 1415 Tuckerman Street NW., Washington, D. C.
Secretary.—Margaret Brown Wilson, A.B. 1933; 6620 Marlboro Pike, District Heights 28, Md.
Treasurer.—Helene Marie Gingras, A.B. 1932; 316 North Carolina Avenue SE, Washington, D. C.

THE ENGINEER ALUMNI ASSOCIATION OF THE GEORGE WASHINGTON UNIVERSITY

The Engineer Alumni Association was organized in 1936 and has been affiliated with the General Alumni Association since that time. Its objects are to unite the graduates and Faculty of the School of Engineering in closer fellowship, to promote the general welfare of the School of Engineering and of the University at large, to foster activities of the engineering organizations recognized by the University, and to advance the profession of engineering in general.

1960-61

- President.*—Paul Kuzio, B.C.E. 1955; 3601 Van Ness Street NW., Washington, D. C.
Vice President.—James M. Brearley, B.S. in Eng. 1911; 1452 Juniper Street NW., Washington, D. C.
Secretary.—Harlan J. Oelke, B.E.E. 1956; 5514 33d Street NW., Washington, D. C.
Treasurer.—Thomas Creswell, B.S. in Eng. 1956; 2701 Philbun Drive, Adelphi, Md.
Executive Committee:
 James J. Crenca, B.E.E. 1955; 1901 Flower Avenue, Silver Spring, Md.
 Benjamin C. Cruickshanks, B.M.E. 1920; 5733 4th Street NW., Washington, D. C.
 George F. Titlington, Jr., B.C.E. 1950; 4111 Rosemary Street, Chevy Chase, Md.

THE GEORGE WASHINGTON UNIVERSITY NURSES ASSOCIATION

The George Washington University Nurses Association was organized in 1914. In 1936 this organization was made an integral part of the General Alumni Association, and graduates of the School of Nursing were accorded associate membership. The objects of the Association are to hold in unison the graduates of The George

Washington University Hospital School for Nurses, to care for its sick members and to promote the advance of nursing in the interest of The George Washington University Hospital.

1960-61

President.—Flora Schroebl; 1830 17th Street NW., Washington, D. C.

Vice President.—Ruby Gottwals; 2129 19th Street N., Arlington, Va.

Secretary.—Laura Sanders; 2707 Adams Mill Road NW., Washington, D. C.

Treasurer.—Alma W. Binks; 4821 16th Street NE., Washington, D. C.

WOMEN'S PHYSICAL EDUCATION ALUMNAE ASSOCIATION

The purpose of this organization is to foster and promote the teaching profession in the fields of Health, Physical Education, and Recreation. Its functions are (1) to attract students to the profession who show evidence of outstanding teaching capability, (2) to offer professional guidance of members in this field of work, (3) to render service to the community, (4) to render service to the University.

1961-62

President.—Beverlie Giss Latimer, B.S. in P.E. 1958; 315 Franklin Street NE., Washington, D. C.

Secretary.—Arlene D. Roeber, B.S. in P.E. 1959; 3 Pooks Hill Road, Bethesda 14, Md.

Treasurer.—Eleanor Baudino, B.S. in P.E. 1955; 4211 Oakridge Lane, Chevy Chase, 15, Md.

REGIONAL ALUMNI CLUBS

Regional alumni clubs sponsored by the General Alumni Association are maintained in the following places: Los Angeles, Calif.; Miami, Fla.; Atlanta, Ga.; Chicago, Ill.; Baltimore, Md.; Boston, Mass.; Detroit, Mich.; Kansas City, Mo.; Brooklyn, N. Y.; New York, N. Y.; Cleveland, Ohio; Tulsa, Okla.; Philadelphia, Pa.; Pittsburgh, Pa.; Dallas, Texas; Seattle, Wash.; Milwaukee, Wis.; Arkansas; Northern California; New Jersey; Ohio River Valley; Utah; Hawaii; Philippine Islands; Puerto Rico.

Information about the officers and activities of these clubs may be obtained from the Alumni Office of the University.

THE LETTERMEN CLUB

The membership of this organization shall consist of those men who, for participation in a sport at The George Washington University, have been awarded varsity letters or freshman numerals, who are no longer undergraduate students of the University; and those men who, for managing a freshman or varsity sport, received letters or numerals.

The objectives of the club are to (1) bring together on a social level former lettermen of all sports, (2) renew acquaintances and promote fellowship, (3) encourage higher ideals of intercollegiate athletics at the University, and (4) assist the University in matters pertaining to athletics when requested.

1960-61

President.—Howard Tihila, B.S. 1938; 5100 Webawken Road, Washington, D. C.

Vice President.—Carl T. Bodolus, A.B. 1954, LL.B. 1960; 10321 Insley Street, Silver Spring, Md.

Secretary.—Joseph J. Bernot, B.S. in P.E. 1950, A.M. in Ed. 1953; 3720 Northampton Street NW., Washington, D. C.

Treasurer.—Adolph Paul Biasini, B.S. 1949, B.S. in Phar. 1953; 3424-A S. Utah Street, Arlington, Va.

THE GRADUATE ENDOWMENT FUND

The Graduate Endowment Fund was founded by the class of 1926 with the object of providing endowment to be used for the development of the University. Membership is limited to seniors and graduates who sign a pledge of \$100, payable annually in ten equal installments.

The pledge notes and funds are held in trust. When the principal reaches the sum of \$100,000, the Board of Administrators of the Fund may pay the University such sums as it may vote for the erection of buildings, acquisition of sites, maintenance, and purchase of equipment. At no time may money be drawn so as to leave a balance of less than \$50,000 on deposit.

THE COLUMBIAN WOMEN

The objectives of this organization are (1) the promotion of acquaintanceship among its members, (2) the advancement of women by the founding of scholarships in the various departments of the University, and (3) the promotion of the interests of the University.

MEMBERSHIP

The following persons shall be eligible for active membership: (a) any woman who is currently registered or has been previously registered as a student in The George Washington University; (b) any woman member of the Faculties or Board of Trustees, any woman on the administrative staff; the wife of any member of the Faculties, Board of Trustees, or of the administrative staff; (c) any woman recipient of an honorary degree from the University.

1960-61

President.—Dora M. Ihle, A.B. 1935, A.M. 1936; 2465 Virginia Avenue NW., Washington, D. C.

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THE WOMEN'S BOARD OF THE GEORGE WASHINGTON
UNIVERSITY HOSPITAL

The object of this organization is to aid in every way the interests and advancement of The George Washington University Hospital. Meetings are held on the first Wednesday of each month, October to June, inclusive. Inquiries regarding membership should be addressed to the Corresponding Secretary, The George Washington University, Washington 6, D. C.

1961-62

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First Vice President.—Mrs. Samuel Burgess II
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Washington 6, D. C.

Academic programs leading to degrees are offered in the following colleges and schools:

Columbian College of Arts and Sciences: Associate in Arts (A.A.), Associate in Science (A.S.), Bachelor of Arts (A.B.), Bachelor of Science (B.S.), Bachelor of Science in Medical Technology (B.S. in Med. Tech.), Master of Arts (A.M.), Master of Fine Arts (M.F.A.), and Master of Science (M.S.)

Graduate Council: Doctor of Philosophy (Ph.D.)

School of Medicine: Doctor of Medicine (M.D.)

Law School: Bachelor of Laws (LL.B.), Master of Laws (LL.M.), Master of Comparative Law (M. Comp. L.), Master of Comparative Law (American Practice) (M. Comp. L. (Am. Prac.)), and Doctor of Juridical Science (S.J.D.)

School of Engineering: Engineering Technologist Certificate (Eng. Tech. Cert.), Bachelor of Civil Engineering (B.C.E.), Bachelor of Electrical Engineering (B.E.E.), Bachelor of Mechanical Engineering (B.M.E.), Bachelor of Science in Engineering (B.S. in Eng.), Master of Science in Engineering (M.S. in Eng.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)

School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.) and Master of Science in Pharmacy (M.S. in Phar.)

School of Education: Bachelor of Arts in Education (A.B. in Ed.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (Adv. Prof. Cert.), and Doctor of Education (Ed.D.)

School of Government, Business, and International Affairs: Bachelor of Arts in Government (A.B. in Govt.), Bachelor of Business Administration (B.B.A.), Master of Arts in Government (A.M. in Govt.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)

College of General Studies: Associate in Arts (A.A.(C.G.S.)), Associate in Science (A.S.(C.G.S.)), Associate in Secretarial Administration (A.Sec.Adm.), Bachelor of Arts (A.B.(C.G.S.)), Bachelor of Science in Cartography (B.S. in Cart.), Master of Arts (A.M.(C.G.S.)), Master of Arts in International Affairs (A.M. in I.A.), and Master of Business Administration (M.B.A.(C.G.S.)).

ANNUAL ISSUES OF THE UNIVERSITY BULLETIN

Requests for the following publications should be addressed as indicated.

| | |
|--|--|
| College of General Studies..... | Dean of the College of General Studies |
| General Catalogue of the University..... | Director of Admissions |
| Graduate Council..... | Dean of the Graduate Council |
| Law School..... | Director of Admissions |
| School of Education..... | Director of Admissions |
| School of Engineering..... | Dean of the School of Engineering |
| School of Medicine..... | Director of Admissions |
| Summer Sessions..... | Dean of the Summer Sessions |
| Schedule of Classes: Fall and Spring Semesters..... | Registrar |
| Schedule of Classes: Summer Sessions..... | Dean of the Summer Sessions |
| Fellowships, Scholarships, Prizes, Financial Aid..... | Chairman, Committee on Scholarships |

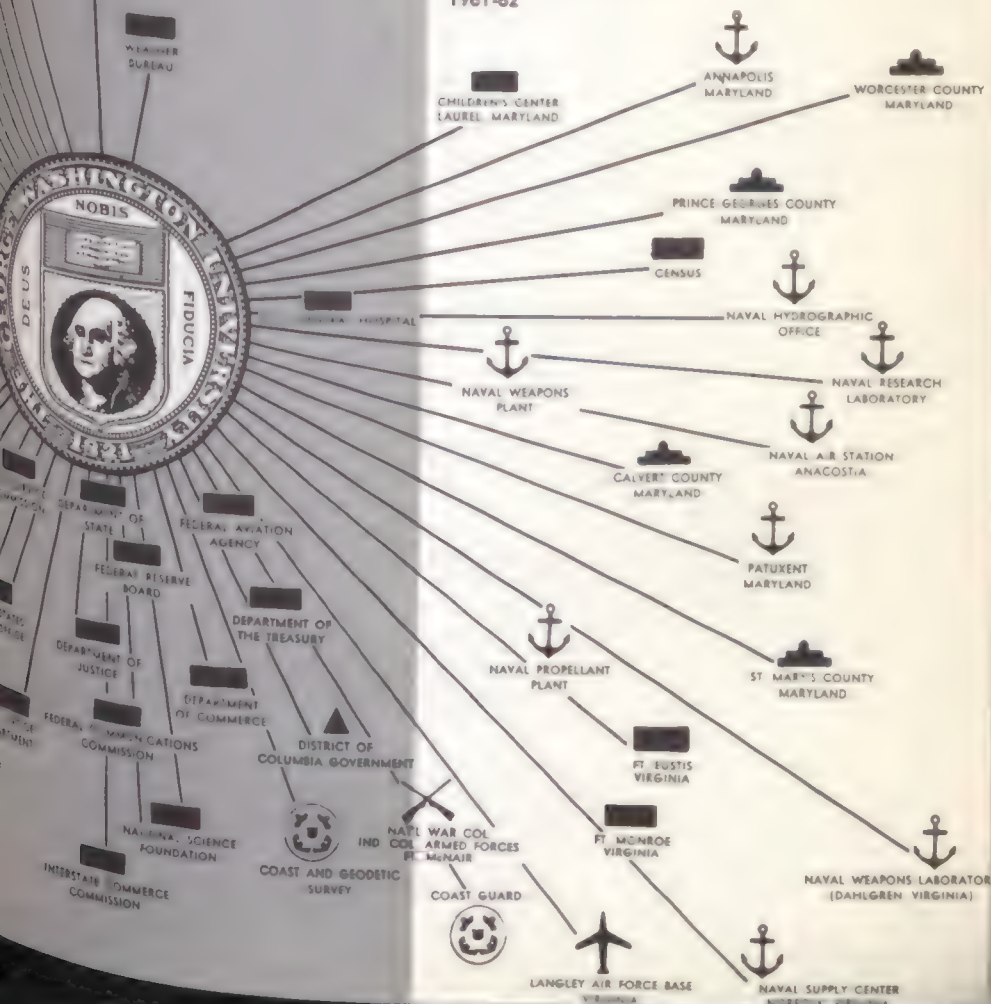
The George Washington University

Bulletin

The College of General Studies

WASHINGTON 6, D. C.

1961-62



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AT WASHINGTON, D. C.
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NOVEMBER (2 ISSUES), AND DECEMBER (2 ISSUES)

SECOND CLASS POSTAGE PAID AT WASHINGTON, D. C.

THE
GEORGE
WASHINGTON
UNIVERSITY
BULLETIN

VOL. LX

No. 13

THE COLLEGE OF
GENERAL STUDIES

WASHINGTON 6, D. C.

PUBLISHED IN AUGUST
MCMLXI

BY THE UNIVERSITY

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COLLEGE OF GENERAL STUDIES CALENDAR*

1961-62

1961

FALL SEMESTER:

| | | |
|---|----------------------|---------------|
| Off-Campus registration†; classes begin..... | Sept. 5-29* | Tues.-Fri. |
| Columbian College of Arts and Sciences advising: freshmen and new sophomores..... | Sept. 11-20 | Mon.-Wed. |
| Orientation Assembly: all new students On-Campus | Sept. 15 | Fri. |
| Curriculum assemblies: new On-Campus students attend one..... | Sept. 15 and 18..... | Fri. and Mon. |
| Placement tests for On-Campus students..... | Sept. 19 | Tues. |
| Qualifying examinations | Sept. 19 | Tues. |
| Registration on Campus‡..... | Sept. 21-23‡ | Thurs.-Sat. |
| Classes begin on Campus..... | Sept. 25 | Mon. |
| CGS meeting of Staff of Instruction, Monroe 102, 8:30 P.M..... | Sept. 29 | Fri. |
| Subjects of Master's theses of Feb. candidates due in Dean's Office..... | Oct. 6 | Fri. |
| Fall Convocation | Oct. 21 | Sat. |
| Application for Feb. Graduation due in Registrar's Office | Oct. 31 | Tues. |
| Veterans' Day. Holiday..... | Nov. 11 | Sat. |
| Thanksgiving recess | Nov. 23-25 | Thurs.-Sat. |
| Master's comprehensive examinations..... | Dec. 1 and 2..... | Fri. and Sat. |
| Graduate Record Examination..... | Dec. 9 | Sat. |
| Christmas recess | Dec. 22-Jan. 2 | Fri.-Tues. |

1962

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|---|-------------|-----------|
| On-Campus classes resume..... | Jan. 3 | Wed. |
| Master's theses of Feb. candidates due in Dean's Office | Jan. 3 | Wed. |
| Off-Campus registration‡; classes begin..... | Jan. 15-31* | Mon.-Wed. |
| Last day of Campus fall-semester classes..... | Jan. 17 | Wed. |
| On-Campus examination period..... | Jan. 22-27 | Mon.-Sat. |
| CGS meeting of Staff of Instruction, Monroe 102, 10:30 A.M..... | Jan. 27 | Sat. |
| Placement tests | Jan. 31 | Wed. |
| Qualifying examinations | Jan. 31 | Wed. |

* Off-Campus Courses in the College of General Studies may be organized upon request at any time during the year.

† Application for degrees, for Graduate Record Examinations, and for comprehensive examinations is the responsibility of the student and must be made at the time of registration for the last classes required for the degree concerned.

‡ September 21 and 22, from 10:00 A.M. to 8:00 P.M.; September 23, from 10:00 A.M. to 1:00 P.M.

SPRING SEMESTER:

| | | |
|--|-----------------|---------------|
| Registration on campus†..... | Feb. 1-3* | Thurs.-Sat. |
| Classes begin on campus..... | Feb. 5 | Mon. |
| Subjects of Master's theses of June candidates due in Dean's Office..... | Feb. 9 | Fri. |
| Winter Convocation. Holiday..... | Feb. 22 | Thurs. |
| Application for June graduation due in Registrar's Office | Feb. 28 | Wed. |
| Master's comprehensive examinations..... | March 30 and 31 | Fri. and Sat. |
| Graduate Record Examination..... | April 7 | Sat. |
| Easter recess | April 20-25 | Fri.-Wed. |
| Master's theses of June candidates due in Dean's Office | April 27 | Fri. |
| Last day of Campus spring-semester classes..... | May 16 | Wed. |
| Information, Education, and Training Officers Luncheon, Faculty Club, 12:30 P.M. | May 17 | Thurs. |
| On-Campus examination period..... | May 21-26 | Mon.-Sat. |
| Memorial Day. Holiday..... | May 30 | Wed. |
| Baccalaureate Service | June 3 | Sun. |
| Commencement | June 6 | Wed. |

SUMMER SESSIONS:

| | | |
|---|---------------|-------------|
| Registration† for summer classes in the Off-Campus Division | May 28-June 8 | Mon.-Fri. |
| Registration† on campus for eight-week term | June 18 | Mon. |
| Classes begin on campus..... | June 19 | Tues. |
| Independence Day. Holiday..... | July 4 | Wed. |
| Master's comprehensive examinations..... | July 6-7 | Fri.-Sat. |
| Application for Oct. graduation due in Registrar's Office | Aug. 1 | Wed. |
| Eight-week term ends..... | Aug. 10 | Fri. |
| Master's theses of Oct. candidates due in Dean's Office | Aug. 10 | Fri. |
| Registration on campus fall semester 1962-63 | Sept. 20-22 | Thurs.-Sat. |

* February 1 and 2, from 10:00 A.M. to 8:00 P.M.; February 3, from 10:00 A.M. to 1:00 P.M.

THE BOARD OF TRUSTEES

The Board of Trustees of the University is composed of the President of the University ex officio and the following persons by election:

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L. Corrin Strong, Ph.B., LL.D.

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Charles Stanley White, M.D., Sc.D.

Lloyd Bennett Wilson

* Nominated by the alumni.

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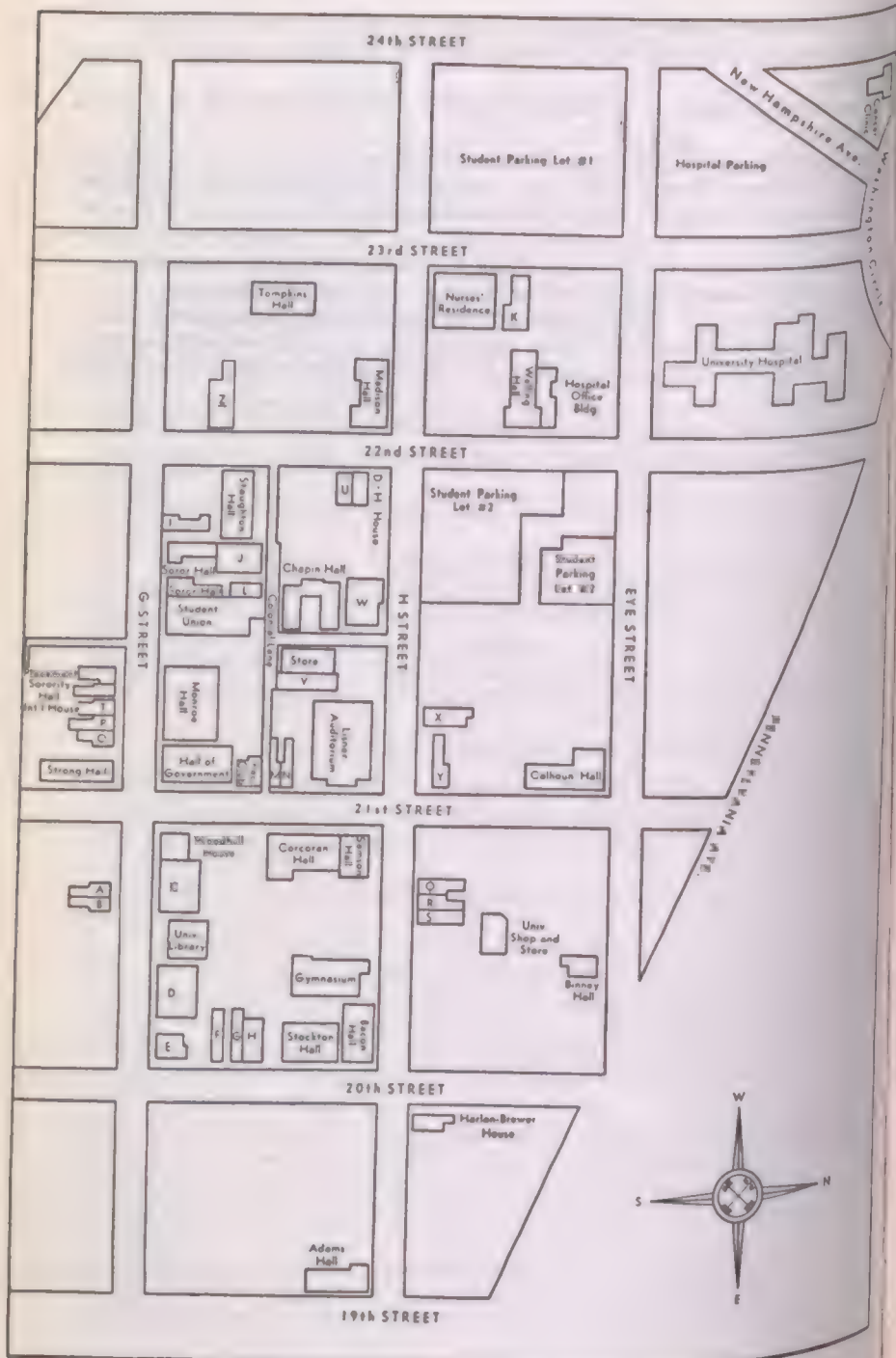
THE UNIVERSITY

Thomas Henry Carroll, B.S., M.B.A., D.C.S., LL.D., *President*
Oswald Symister Coleclough, B.S., LL.B., LL.D., Sc.D., *Provost and Dean of Faculties*
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John Francis Latimer, Ph.D., *Associate Dean of Faculties; University Marshal*

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Arthur Edward Burns, Ph.D., *Dean and Chairman of the Graduate Council*
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Martin Alexander Mason, B.S. in Eng., Ing.-Dr., *Dean of the School of Engineering*
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James Harold Fox, A.M., Ed.D., *Dean of the School of Education*
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Robert Whittington Eller, B.S., A.M. in Ed., *Assistant Dean of the College of General Studies*



HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,— in acquiring knowledge in the principles of Politics & good Government".

It was George Washington's hope that the "General Government" would extend toward such an institution "a fostering hand". No steps were taken by Congress to carry out the provisions of Washington's will, and the stock he had bequeathed for the establishment of a university in the District of Columbia became valueless owing to the failure of the Potomac Canal properties.

Meanwhile, however, a movement was started by private persons under the leadership of Luther Rice to establish an institution of higher learning at the seat of the National Government for the education of the Baptist ministry and to afford general collegiate training. In 1819 an association was formed by Luther Rice, Obadiah B. Brown, Spencer H. Cone, and Enoch Reynolds for the purpose of raising funds to buy land for the use of the college.

A group of the Nation's leaders who were especially interested in Washington's idea became patrons of the college and contributed to funds raised for the purchase of land and erection of buildings. Among them were James Monroe, President of the United States; William H. Crawford, Secretary of the Treasury; John C. Calhoun, Secretary of War; William Wirt, Attorney General; Return J. Meigs, Postmaster General; and thirty-two members of Congress.

Legally to implement the college a petition was made to Congress for the incorporation of "the General Convention of the Baptist Denomination in the District of Columbia for evangelical and literary purposes". This petition was denied by Congress, on April 26, 1820, because of its sectarian character.

Failing to obtain a denominational charter members of the association enlarged their objective to embrace national aims, and with the sponsorship of Government leaders there was presented in Congress a bill for the incorporation of "the Columbian Society for literary purposes", it being proposed to realize in this way "the aspirations of Washington, Jefferson and Madison for the erection of a university at the seat of the federal government."

Acting upon this second petition, on February 9, 1821, Congress chartered Columbian College in the District of Columbia, inserting in the charter by special action the provision "that persons of every religious denomination shall be capable of being elected Trustees; nor shall any person, either as President, Professor, Tutor or pupil, be refused admittance into said College or denied any of the privileges, immunities or advantages thereof, for or on account of his sentiments in matters of religion".

Thus Columbian College in the District of Columbia was chartered by Congress as one of the early nonsectarian institutions of higher learning in the United States, under the distinguished favor of President James Monroe and members of his Cabinet.

A tract of approximately forty-seven acres, extending about one-half mile north west of Boundary Street (Florida Avenue) between Fourteenth and Fifteenth Streets was purchased and by 1822 the main building was completed sufficiently to use.

Two years later, when the first Commencement was held on December 15, 1824 Congress and the Supreme Court adjourned their sessions to enable their members to attend the exercises. President Monroe, John Quincy Adams, John C. Calhoun, Henry Clay, and the Marquis de Lafayette headed the eminent company in attendance.

By an act of Congress of March 3, 1873, the name of the College was changed to "Columbian University", in recognition of the enlarged scope of the institution. In 1884 the University was moved from its first location on "College Hill", now Columbia Heights, to the new University Hall built for it at Fifteenth and H Streets. Near-by buildings accommodated the School of Medicine and somewhat later, the Law School.

For a period of six years, from 1898 to 1904, the University was placed under control of the Baptist Denomination. In 1904 an act restoring the original secular character of the University and authorizing change of name to The George Washington University was passed by Congress.

Subsequently all colleges, schools, and divisions of the University except the School of Medicine were brought together in the area bounded by Nineteenth, Twenty-third, and G Streets, and Pennsylvania Avenue NW. The School of Medicine is situated on H Street between Thirteenth and Fourteenth Streets NW.

The endowment of the University is \$7,530,000.

THE COLLEGES, SCHOOLS, AND DIVISIONS

The George Washington University includes thirteen colleges, schools, and divisions, as follows:

Columbian College of Arts and Sciences offers the four-year programs leading to the degrees of Bachelor of Arts and Bachelor of Science. In cooperation with the Department of Pathology and the University Hospital, it offers a course in Medical Technology leading to the degree of Bachelor of Science in Medical Technology. In addition to the four-year programs, Columbian College offers two-year curricula including preprofessional and terminal, leading to the degrees of Associate in Arts and Associate in Science. At the graduate level, Columbian College offers studies leading to the degrees of Master of Arts, Master of Science, and Master of Fine Arts.

The Graduate Council offers a program of advanced study and research leading to the degree of Doctor of Philosophy.

The School of Medicine offers work leading to the degree of Doctor of Medicine.

The Law School offers professional and graduate courses leading to the degrees of Bachelor of Laws, Juris Doctor, Master of Laws, Master of Comparative Law, and Doctor of Juridical Science.

The School of Engineering offers courses leading to the Engineering Technologies Certificate and the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of Science in Engineering, Master of Science in Engineering, Master of Engineering Administration, and Doctor of Science.

The School of Pharmacy offers courses leading to the degrees of Bachelor of Science in Pharmacy and Master of Science in Pharmacy.

The School of Education offers undergraduate programs leading to the degrees of Bachelor of Arts in Education and Bachelor of Science in Physical Education, and

graduate studies leading to the degrees of Master of Arts in Education and Doctor of Education.

The School of Government, Business, and International Affairs offers work leading to the following degrees: (1) Bachelor of Arts in Government with a major in International Affairs or Public Affairs; (2) Bachelor of Business Administration with a major in Accounting, Business Administration, or Business and Economic Statistics; (3) Master of Arts in Government with a major field in International Affairs, Public Affairs, Public Administration, Personnel Administration, or Economic Policy; (4) Master of Business Administration with a major field in Accounting, Business and Economic Statistics, General Business Administration, Hospital Administration, or Personnel Administration; (5) Doctor of Business Administration.

The College of General Studies supplements the adult education program of the University through its Off-Campus Division, Campus Division, and Division of Community Services. This College offers programs leading to the degrees of Associate in Arts; Associate in Science; Associate in Secretarial Administration; Bachelor of Arts; Bachelor of Science in Cartography; Master of Arts in the fields of Controllershship, Governmental Administration, and Personnel Management; Master of Business Administration; and Master of Arts in International Affairs. The College also makes available off-campus courses for mature students, not candidates for degrees.

The Division of University Students makes available campus courses for mature students, not candidates for degrees in this University.

The Division of Special Students makes available courses for students in the process of qualifying for degree candidacy.

The Division of Air Science offers a program of Air Force ROTC training which is integrated with the curricula of the colleges and schools of the University and leads to appointment as a commissioned officer in the United States Air Force Reserve.

The Summer Sessions.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

LOCATION

The George Washington University is in downtown Washington, four blocks west of the White House and east of the Potomac River with its extensive parkway. Within a few blocks are the buildings housing the offices of many of the departments of the Government.

GOVERNMENT

The government and general educational management of The George Washington University are vested in a self-perpetuating Board of Trustees, with the President of the University as a member *ex officio*. The members of the Board are named for a period of three years and are divided into three classes. The members of one class are elected at each annual meeting to fill the places of the members whose terms of office expire. Two members of each class are nominated by the Alumni Association.

COLLEGE OF GENERAL STUDIES

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JOHN ARNOLD TIMOUR, A.M., *Director of the Off-Campus Division*

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MARVYN JEAN POWERS, A.M., *Assistant Director of the Off-Campus Division*
ALEXANDER GRANT ROSE III, A.M., *Assistant Director of the Off-Campus Division*
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LILLIAN FOX QUIGLEY, *Assistant to the Assistant Dean; Assistant Director of the Division of Community Services*
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* To be opened February 1, 1962.

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 EARL ELTON PONTIUS, JR., M.B.A., *Assistant Professor of Accounting*
 RICHARD RALPH POTTER, M.S. in E.E., *Associate in Physics*
 ANDREW JOSEPH POTTS, A.B., *Associate in Accounting*
 RICHARD POWERS, Ph.D., *Associate Professorial Lecturer in Economics*
 LEONARD PRESTWICH, Ph.D., *Associate Professor of Business Administration*
 MAURICE THOMAS PRICE, Ph.D., *Professorial Lecturer in Psychology*

- DAVID HENRY PRITCHARD, B.S., Ed.M., *Lecturer in Psychology*
 JOHN ROBERT PROBERT, Ph.D., *Associate Professorial Lecturer in Public Administration*
 JOHN PROVAN, M.S., *Associate Professorial Lecturer in Business and Public Administration*
 VIRGINIA CARDWELL PURDY, A.M., *Associate in History*
 ROBERT RAFUL, M.B.A., *Lecturer in Business Administration*
 MARTHA NORMAN RASHID, Ph.D., *Associate Professorial Lecturer in Education*
 FREDERICK VENABLE REED, A.M., *Lecturer in Mathematics*
 JOHN ROBERT REED, A.B., *Special Lecturer in the College of General Studies*
 RALPH JULIAN RICHARDS, JR., M.B.A., *Associate in Accounting*
 RAY JOSEPH RICHARDS, A.B., C.L.U., *Associate Professorial Lecturer in Business Administration*
 ALLEN LEROY RIGGS, B.S., *Lecturer in Cartography*
 ROBERT STANLEY RIPLEY, A.B., *Associate in English*
 BLAKE SMITH ROOT, A.M., Ed.D., *Professor of Education*
 ALEXANDER GRANT ROSE III, A.M., *Associate in English*
 ROBERT MARTIN ROTH, Ph.D., *Lecturer in Psychology*
 VINCENT ROTUNDO, A.M., *Associate in Political Science*
 CAROL RUTH ST. CYR, Ph.D., *Associate Professor of Education*
 GENNARO ANTHONY SANTANGELO, A.M., *Assistant Professor of English*
 ALFONSO SAPIA-BOSCH, B.S., *Associate in Spanish*
 HAROLD HENRY SAUNDERS, Ph.D., *Lecturer in History*
 RICHARD HAROLD SCHLAGEL, Ph.D., *Associate Professor of Philosophy*
 WOLFGANG SCHWARTZ, Ph.D., *Lecturer in Psychology*
 LESLIE ROBERT SCHWEIZER, M.S., *Associate Professorial Lecturer in Physics*
 ROBERT EUGENE SEARS, M.S., *Lecturer in Statistics*
 SALLY OLEON SHAMES, Ph.D., *Associate in Sociology*
 GEORGE PAUL SHEYA, LL.B., *Associate Professorial Lecturer in Public Administration*
 KENNETH ABRAM SHUTTS, A.M., *Lecturer in History*
 BOYD BERKELEY SIBERT, JR., M.B.A., *Special Lecturer in the College of General Studies*
 HARRY FRITCHEY SIEBER, JR., M.S., *Lecturer in Statistics*
 JOHN WILLIAM SKINNER, Ph.D., *Associate Professor of Economics*
 MORRIS JAMES SLONIM, M.B.A., *Lecturer in Statistics*
 HAROLD LEON SMOCK, M.P.A., *Lecturer in Speech*
 WALDO SOMMERS, Ph.D., *Associate Professor of Public Administration*
 KENNETH MALCOLM SOWERS, A.M., D.D., *Associate Professorial Lecturer in Business Administration*
 WILLIAM SPENCER, A.M., *Associate Professorial Lecturer in Political Science*
 THOMAS ALFRED STANHOPE, A.M., *Associate in English*
 PETER FRANCIS STEBE, M.S., *Lecturer in Mathematics*
 EDWARD WILLIAM STEELE, A.M., *Lecturer in Political Science*
 JAMES CHARLES STEPHENS, A.M., *Professorial Lecturer in Public Administration*
 ROBERT BURNS STEVENS, A.M., *Associate in English*
 CARL JOHN STRINGER, JR., M.B.A., *Lecturer in Business Administration*
 FRANCIS JOHN SULLIVAN, A.M., *Lecturer in Accounting*
 JACKWELL SUSMAN, B.S., *Associate in Sociology*
 JAMES THOMAS SUTER, A.M., *Associate in Psychology*
 ROLAND HENRY TANCK, Ph.D., *Lecturer in Psychology*

WILLIAM LONSDALE TAYLER, Ph.D., *Professor of International Affairs*
 LEWIS CLARK TAYNTON, M.B.A., *Lecturer in Business Administration*
 WALTER JACK TENNANT, A.M., *Associate in Psychology*
 HOWARD ELSWORTH THOMAS, Ph.D., *Professorial Lecturer in Education*
 ARTHUR EDMUND TIEMANN, A.B., *Lecturer in Statistics*
 JOHN ARNOLD TIMOUR, A.M., *Associate in English*
 NANCY MARIE PATTERSON TISCHLER, Ph.D., *Assistant Professor of English*
 TURNER CLARENCE TRIPPE, JR., B.S., LL.B., C.P.A., *Lecturer in Accounting*
 FRED SALISBURY TUPPER, Ph.D., *Professor of English Literature*
 EDGAR ALLEN TURPIN, JR., A.B., LL.B., *Associate Professorial Lecturer in Business Administration*
 CURTIS EDWARD TUTHILL, Ph.D., *Associate Professor of Psychology*
 JAMES WALTER TYLER, Ed.D., *Lecturer in Education*
 GEORGE UREKE, M.B.A., *Lecturer in Business Administration*
 ARTHUR USCHEN, M.B.A., *Professorial Lecturer in Business Administration*
 GERWIG ERNST VIERANS, Doktor-Ingenieur, *Lecturer in Physics*
 DARYLE ALEXIS WADE, M.B.A., *Special Lecturer in the College of General Studies*
 PAUL WAKEFIELD, A.M., *Associate in English*
 REGIS HILLS WALTHER, A.M., *Associate in Psychology*
 ROBERT MARION WARD, M.B.A., *Lecturer in Business Administration*
 JAMES ROBERT WASON, A.B., *Lecturer in History and Economics*
 WARREN KENNETH WATSON, D.B.A., *Lecturer in Business Administration*
 CLARENCE NORWOOD WEEMS, Ph.D., *Professorial Lecturer in Psychology*
 RENEE FANTIN WEISZ, A.B., *Associate in French*
 RICHARD BOWKER WESTBROOK, A.M., *Lecturer in Geography*
 JOHN HOWELL WHITE, A.M., *Associate Professorial Lecturer in Mathematics and Statistics*
 LELAND ELWOOD WHITE, B.S., *Special Lecturer in the College of General Studies*
 GEORGE BARWICK WILMOT, Ph.D., *Lecturer in Mathematics*
 JAMES WEBER WILSON, M.B.A., *Associate Professorial Lecturer in Business Administration*
 DANIEL WIT, Ph.D., *Professorial Lecturer in Public Administration*
 CARL PACKARD WOLLE, Ph.D., *Associate Professorial Lecturer in Public Administration*
 BURTON WRIGHT, M.S., *Associate in Psychology*
 WILLIAM HARVEY WROTEN, JR., Ph.D., *Associate Professorial Lecturer in History*
 WILLIAM PACKARD YOUNG, A.M., *Lecturer in Education*
 JOSEPH FRANK ZAWACKI, M.S., *Lecturer in Mathematics*
 GUY GEOFFREY ZIEGLER, B.S., *Associate in Mathematics*

COMMITTEES*

THE DEAN'S COUNCIL†

1961: A. R. Johnson, B. S. Root: 1962: D. C. Faith, B. D. Van Evera: 1963:
 R. H. Moore, C. H. Walther

COMMITTEE ON UNDERGRADUATE ADMISSION AND ADVANCED STANDING

G. L. Angel (*Chairman*), R. J. Alexander, J. C. Dockeray, J. W. Harkness, L. P. Leggette, J. L. Metivier, Jr., J. Y. Ruth (*ex officio*)

* The Dean and Assistant Dean are members *ex officio* of all committees.

† The Dean of Faculties, the Dean and Assistant Dean of the College are members *ex officio* of the Council.

COMMITTEE ON GRADUATE STUDIES

G. L. Angel (*Chairman*), J. W. Brewer, J. C. Dockeray, J. L. Jessup, A. R. Johnson, Waldo Sommers, J. Y. Ruth (*ex officio*)

COMMITTEE ON SCHOLARSHIP

R. W. Eller (*Chairman*), H. G. Detwiler, R. B. Eastin, Florence Mears, F. R. Houser (*ex officio*)

COMMITTEE ON DEVELOPMENT, CURRICULUM, AND PROGRAMS

B. D. Van Evera (*Chairman*), J. H. Coberly, R. W. Stephens

GENERAL INFORMATION

The objectives of the College of General Studies are to extend the adult education facilities of the University; to introduce experimental procedures in conducting programs of study for mature students; and to provide auxiliary educational services other than formal programs of study for the community.

Established in October 1950, the College of General Studies is organized into the following divisions: the Off-Campus Division, the Campus Division, and the Division of Community Services. It also conducts institutes and special programs. Offices are in building F at 706 Twentieth Street NW.

ACADEMIC STANDARDS

The staff of instruction is made up of members of the regular University Faculty and staff of instruction and other individuals of recognized academic and professional competence.

The academic standards of the University are maintained in off-campus credit courses.

Limits on the size of classes may be imposed in order to maintain the quality of instruction.

OFF-CAMPUS DIVISION

This Division works closely with personnel administrators, training officers, school officials, and others interested in developing programs of in-service training, in response to increased demands of government, education, business, and industry. Programs are also offered for service personnel who wish to work toward degrees or for professional proficiency. Off-Campus centers are listed on pages 44-63.

TYPES OF PROGRAMS

The College will offer a course in any liberal arts field on the college or university level for which there is a sufficient demand and for which a qualified instructor can be found, regardless of whether or not it is included in the regular offering of the University. According to the subject matter and the wish of the organizing group, courses are arranged as credit courses applicable toward a degree or as non-credit courses. For information concerning arrangements for courses or comprehensive programs of study, phone FEderal 8-0250, Extension 186 or 441.

HOW TO ORGANIZE AN OFF-CAMPUS PROGRAM

Any organization, group, installation, or agency interested in having the University organize and conduct a course or a comprehensive educational program, should

get in touch with the Off-Campus Division of the College of General Studies (FEderal 8-0250, Extension 487 or 441). A representative will be sent upon request to discuss organizational plans.

TELEVISION COURSES

In cooperation with Channel 9, WTOP-TV in Washington, D. C., the College of General Studies has offered, since the spring of 1959, credit and noncredit television courses in Art, English, History, Physiology, and Russian as part of the "Classroom Nine" series. Courses are scheduled Monday, Wednesday, and Friday from 6:30 to 7:00 A.M. The registration fee includes the cost of textbook and telecourse guide.

During the spring of 1961, the College of General Studies, in cooperation with the National Naval Medical Center, offered a credit and noncredit television course in General Psychology to a closed circuit network consisting of the Naval Medical Center, Walter Reed Army Medical Center, the National Institutes of Health, the Air Force Hospital at Andrews Air Force Base, the Army Hospital at Fort Belvoir, the Army Hospital at Fort George Meade, and the Army Hospital at Fort Detrick. The course was scheduled for Monday, Wednesday, and Friday from 12:10 to 1:00 P.M. The registration fee included the cost of textbook and telecourse materials.

Additional television courses may be offered from time to time. For further information, telephone Marvin J. Powers, College of General Studies, 706 Twentieth Street NW.; FEderal 8-0250, Extension 487.

The Coordinator for television programs is Lillian Brown, Director of Radio and Television, Building S, Room 22, 2025 H Street NW.; FEderal 8-0250, Extension 370.

RADIO COURSES

In cooperation with WTOP AM and FM in Washington, D. C., the College of General Studies offered a noncredit course in Conversational French, during the spring of 1961. The registration fee included the cost of textbook and radio course materials.

Additional radio noncredit courses may be offered from time to time. For further information, telephone Marvin J. Powers, College of General Studies, 706 Twentieth Street NW.; FEderal 8-0250, Extension 487.

The Coordinator for radio courses is Lillian Brown, Director of Radio and Television, Building S, Room 22, 2025 H Street NW.; FEderal 8-0250, Extension 370.

ADMISSION

Registration in an off-campus course constitutes admission to that course only. It does not constitute admission to degree candidacy or carry with it permission to attend University classes on campus.

CREDIT COURSES

Registration is conducted before or at the first meeting of each class. Transcripts of previous academic work are not required. Registration is restricted to those whose qualifications indicate that they are able to complete the courses successfully.

Auditing.—With the permission of the instructor, adequately prepared students may register as "Auditors". An auditor is not required to take active part in the exercises or to take examinations. No grades will be reported, and no credit will

be received. Tuition is the same as for credit courses. If a course has 15 sessions a student may, with the approval of the Dean, change from credit to audit status prior to the 10th class session. If a course has 30 sessions, a student may, with the approval of the Dean, change from credit to audit status prior to the 20th class session. A student will not be permitted to change from audit to credit status after the second class session of any course.

Concurrent Registration.—A student registered as a degree candidate in any other college or school of the University may take credit courses in the College of General Studies only by permission (granted prior to registration) of the dean of the college or school concerned. The Concurrent Registration form, available at the Office of the College of General Studies, must be filled in by the student, signed by the dean of the college or school concerned, and submitted with the registration form.

NONCREDIT COURSES

Noncredit courses are open to anyone interested in enrolling. When a course is organized at the request of a particular agency or group, admission may be restricted to the students recommended by the sponsoring organization.

DEGREE CANDIDACY

Application for degree candidacy should be made only if there is a reasonable assurance that the student will be in the area long enough to complete the requirements. Credits granted by this College for the General Educational Development tests and for service schools and correspondence courses may or may not be accepted by another institution or by other schools and colleges of this University.

The following factors are considered in determining the eligibility of an applicant:

1. The adequacy of previous academic work as preparation for the course of study contemplated, including quantity and quality of work and the standing of the institution in which it was done.
2. Results of specified tests, when prescribed by the Committee on Admissions.
3. The aptitude of the student for the curriculum contemplated.
4. The character of the student.

The University reserves the right to refuse admission to any student who has a previous academic record of such grade as to create doubt of his ability to pursue college work successfully, or who, for any other reason, would not be an acceptable student.

METHODS OF ADMISSION FROM SECONDARY SCHOOLS

An applicant from a secondary school may seek to qualify for admission to degree candidacy by certificate or examination. In either case, the applicant must send the high school record form, available at the Office of the Director of Admissions or at the College of General Studies, to his high school principal with the request that the principal fill it out and mail it directly to the Office of the Director of Admissions, The George Washington University, Washington 6, D. C.

Consideration for admission is based upon the combined evidence of (1) an acceptable certificate of graduation, showing a minimum of fifteen "units" * from an accredited secondary school; (2) the principal's statement that the applicant is ade-

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 60-minute periods of prepared classroom work.

quately prepared to undertake college work with reasonable prospect of success; (3) tests as specified by the Committee on Undergraduate Admission and Advanced Standing, and (4) course work completed with the College of General Studies prior to making application for admission. (See Special Requirements for Admission to Degree Candidacy.)

Certification by the principal that the student has satisfied all curriculum requirements of the school will be accepted in lieu of any prescribed distribution of units.

A desirable secondary school program in preparation for college would include: four years of English, at least two years of one foreign language, two years of natural or physical science with laboratory instruction (over and beyond the so-called "General Sciences"), two or three years of social studies (with concentration on history), one or two years of basic mathematics.

The College of General Studies Committee on Admission and Advanced Standing will consider the adequacy of the qualifications for academic success of an applicant who, because of unusual circumstances, does not present all the formal requirements stated above.

FROM HIGHER INSTITUTIONS

An applicant for advanced standing may be considered for admission upon the presentation of satisfactory credentials from an accredited institution of higher learning.

Properly certified courses taken at accredited colleges or universities may be applied toward a degree in the College of General Studies, subject to the curriculum requirements of the degree program for which admission is sought. Work of low passing grade (such as *D* or the equivalent) is not acceptable for transfer.

The University reserves the right to refuse credit for transfer in whole or in part, or to allow it provisionally. Credit so given may be withdrawn for subsequent poor work.

It is the responsibility of the student to have an official transcript sent directly from each educational institution formerly attended to the Office of the Director of Admissions, The George Washington University, Washington 6, D. C.

If the transcript of record from a higher institution includes the record of his secondary school work, it is not necessary for the applicant to have forwarded a separate record from the principal of the secondary school.

SPECIAL REQUIREMENTS FOR ADMISSION TO DEGREE CANDIDACY

To be eligible for admission to degree candidacy the student must have satisfactorily completed 6 semester hours of approved academic work in the College of General Studies. Twelve semester hours of acceptable work are required of applicants whose previous college records might make admission questionable. A grade of *C* or better is required for such qualifying courses toward undergraduate degrees; for Master's candidacy an average of *B* or better is required for undergraduate prerequisite courses, *S* (satisfactory) or *E* (excellent) for graduate courses.

Application for degree candidacy should be filed as soon as the required 6 hours are satisfactorily completed.

Students must confer with the Assistant Dean, the Director of the Campus Division, or the Director of the Off-Campus Division before applying for admission to degree candidacy. Appointments may be made by telephone (FEderal 8-0250, Extension 411 or 487) or by letter.

ADVANCED STANDING

In addition to credit allowed in transfer from other accredited colleges or universities, see "From Higher Institutions", above, advanced standing may be obtained by the following methods. For detailed information concerning advanced standing acceptable in the curriculum contemplated, see "Advanced Standing" under the degree concerned.

1. *GED Tests*.^{*}—A maximum of 24 semester hours obtained on the basis of the College Level GED test (first year):

Test 1: Correctness and Effectiveness of Expression

English 1-2: *English Composition* (6)

Test 2: Interpretation of Reading Materials in the Social Studies

Political Science 9: *Government of the United States* (3)

Sociology and Anthropology 1: *Man in Modern Society* (3)

Test 3: Interpretation of Reading Materials in the Natural Sciences

Chemistry 3-4: *Fundamentals of Physical Sciences* (6)

Test 4: Interpretation of Literary Materials

English 51-52: *Introduction to English Literature* (6)

Credit earned by GED tests does not substitute for courses required in or prerequisite to a departmental major, and must not duplicate credits previously earned in college courses. Service personnel make arrangements to take GED tests, prior to or at the time of applying for degree candidacy, through the education officers: civilian students, through the Dean or Assistant Dean, immediately after application for degree candidacy. No decision on an application can be reached until the tests have been evaluated.

2. *Service Schools*.—A maximum of 24 semester hours may be obtained on the basis of service schools satisfactorily completed, as evaluated by the United States Armed Forces Institute Guide to the Evaluation of Educational Experience in the Armed Forces. Ordinarily such credits are counted as electives. No credit will be allowed for military experience as such.

3. *Validating Examinations*.—A maximum of 12 semester hours may be obtained by validating examinations. With the approval of the Dean or the Assistant Dean and the department concerned, permission to take such examinations is granted those who are qualified by work experience and background. Validating examinations must be completed during the first full semester in which the student is registered as a degree candidate. The fee for each three-hour course examination is \$35.

4. *Correspondence Courses*.—A maximum of 12 semester hours may be earned through the successful completion of correspondence courses of college level which are on the approved list of The George Washington University.

EXAMINATION FOR WAIVING CURRICULUM REQUIREMENTS

During the first full semester of degree candidacy, a student wishing to omit a required course may, with the permission of the Dean or the Assistant Dean, take a waiver examination, the passing of which relieves him of the curriculum requirement and qualifies him for registration in an advanced course. *Passing of the waiver examination does not entitle the student to credit toward a degree.* The fee for each three-hour course examination is \$5.

^{*} The present GED tests expire December 31, 1961. After that date (possibly for two years), while new tests are being developed, there will be no GED tests for civilians and veterans. Such tests will, however, continue to be available to military personnel at military installations only, during this interim period.

FEES

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|---|---------|
| Application fee charged each applicant for admission to degree candidacy (payable by check or money order only and sent directly to Office of the Director of Admissions), nonrefundable..... | \$10.00 |
| Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable..... | 5.00 |
| Graduation Fees | |
| Wherein an Associate's degree is granted..... | 10.00 |
| Wherein a degree other than an Associate's is granted..... | 25.00 |
| Tuition Fees | |
| For each semester hour for which a student registers on-campus..... | 30.00 |
| For each semester hour for which a student registers off-campus..... | 20.00 |
| The Education Program of the Armed Forces may defray a maximum of \$7.50 a semester hour, for service personnel. | |
| Graduate Record Examination fee (to cover two examinations), charged each candidate for a Bachelor's degree in the College of General Studies. (For procedure, see Graduate Record Examination, page 27)..... | 10.00 |
| Fee for binding the Master's thesis..... | 6.00 |
| Withdrawal fee, charged each student who drops a course for which he is registered, before the first class meeting..... | 5.00 |
| Reinstatement fee, charged each student who is reinstated after suspension for delinquency in payment of fees..... | 5.00 |
| Residence fee, charged each off-campus degree candidate who wishes to maintain "in residence" status during any semester of absence from the University | 20.00 |
| Residence fee, charged each on-campus degree candidate who wishes to maintain "in residence" status during any semester of absence from the University | 30.00 |
| General Education Development Battery (GED tests) fee (college level).... | 8.00 |
| Fee for each examination to waive a curriculum requirement..... | 5.00 |
| Validating Examination fee..... | 35.00 |
| Transcript fee, charged for each transcript of record after the first | 1.00 |

PAYMENT OF FEES

OFF-CAMPUS COURSES

| | |
|-------------------------------------|--|
| For fifteen-week credit course..... | Payable in 3 equal installments: the first at time of registration; the second, 30 days after the beginning of the course; the third, 60 days after the beginning of the course. A student who fails to complete all tuition payments no later than 15 days after the final installment is due will be automatically suspended and may not attend classes or take final examinations until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of \$5. |
| For eight-week credit course | Payable in full at registration |
| For noncredit course | Payable in full at registration |

CAMPUS COURSES

For regulations governing the payment of fees for Campus courses, see the University catalogue.

* Payable at the time of application for transfer.

REFUND OF FEES

OFF-CAMPUS COURSES

In no case will a refund of fees be made for eight-week credit courses or for noncredit courses unless the course is cancelled.

Fifteen-week credit courses.—In no case will the initial payment for a course be refunded unless the course is cancelled. The second and third payments will be waived or refunded if the course is dropped within the first thirty days. The third payment will be waived or refunded if the course is dropped within the second and thirty days. No refund will be allowed on withdrawal subsequent to the second thirty-day period.

This regulation does not apply if a student withdraws from one course to enter another, or if a class is cancelled because of insufficient enrollment.

CAMPUS COURSES

For regulations governing refund of fees for Campus courses, see the University catalogue.

VETERANS EDUCATION

The George Washington University is approved to provide training for eligible persons under the provisions of Public Laws 634, 190, 550, 16, and 894. The Office of Veterans Education, Building Q, 2029 H Street NW. (Telephone: Federal 8-0250, Extension 334) operates as a service bureau for such persons interested in studying at the University and acts in a liaison capacity between the University and the Veterans Administration. Here information may be obtained concerning the educational program of the University and the procedures for securing educational benefits under the GI and War Orphans bills.

Eligible persons are advised to consult the Office of Veterans Education at the University concerning the procedure for securing educational benefits before applying to the Veterans Administration for certification. The Veterans Administration is on Constitution Avenue at Twentieth Street NW., Washington 25, D. C.

PUBLIC LAW 634 (War Orphans' Educational Assistance Act)

A child of a person who died of a disease or injury incurred or aggravated while on active duty in the Armed Forces during World War I, World War II, or the Korean Conflict may be eligible for educational assistance under this Act, if certain age requirements are met. In the case of a child who has not reached the age of majority, his guardian must make application for him to the Veterans Administration.

PUBLIC LAW 190 (World War II GI Bill Extension)

The educational benefits for World War II veterans terminated July 25, 1950, except that persons enlisting or reenlisting in the Armed Forces between October 6, 1945, and October 5, 1946, may count the entire period of such enlistment or reenlistment as war service for purposes of GI Bill benefits. Such enlistees have four years from the date that enlistment ended to begin training and nine years from that separation date to complete training under this provision.

PUBLIC LAW 550 (Korean GI Bill)

To be eligible under this Law, a veteran must have been in service between June 27, 1950, and January 31, 1955, and must no longer be on active duty.

At least thirty days prior to registration the veteran should apply to the Veterans Administration for a Certificate for Education and Training, for presentation to the University Office of Veterans Education at the time of registration. A photostatic copy of his DD214 must accompany the original application for certification.

PUBLIC LAWS 16 AND 894 (Vocational Rehabilitation)

Disabled veterans desiring vocational rehabilitation under either Law should apply to the Veterans Administration for approval of their training objectives at least sixty days prior to registration.

REGULATIONS

AMOUNT OF WORK

A full-time student who is not on probation may take ordinarily not more than 17 semester hours. A student employed more than 24 hours a week, who is not on probation, may take not more than 10 hours.

A full-time student whose quality-point index is 3.50 or higher may take not more than 19 hours. An employed student who meets the same standard may take not more than 12 hours.

A student who accepts employment after registration or at any time during a semester must report that fact immediately to the Dean so that his program may be adjusted, if necessary.

ATTENDANCE

The student is held responsible to the instructor in charge of the course for all of the work of the course. All absences must be excused before provision will be made for the student to make up work missed.

Absences will be excused if the number of class hours missed does not exceed the semester hours for the course. In a fifteen-week course in which classes meet once a week, *one* unexcused absence is permitted. In a fifteen-week course in which classes meet twice a week, *two* unexcused absences are permitted. In an eight-week course meeting twice a week, *one* unexcused absence is permitted.

Absences immediately preceding or following holiday periods are counted double. Excuses for two or more consecutive class periods, and for absences from examinations which have been announced in advance, may be obtained only by making written application to the instructor.

INDEPENDENT STUDY PLAN

A student of demonstrated capacity, with special interest in the subject matter of a course, may be permitted to undertake independent study under the personal direction of an instructor, in accordance with the rules of the department or departments concerned.

SCHOLARSHIP

GRADES

Grades are mailed to the student through the Office of the Registrar at the close of each semester. They are not given out by instructors or the administrative staff of the College.

Undergraduate Grading System.—*A*, excellent; *B*, good; *C*, average; *D*, passing; *F*, failing. Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be assigned. The symbol *I* indicates

that a satisfactory explanation has been given the instructor for the student's failure to complete the work of the course. An "incomplete" cannot be made up after the lapse of one calendar year, except by written permission of the Dean's Council.

A student may not repeat, for a grade, a course in which he has received a grade of *D* or above, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Dean by the appropriate departmental executive officer.

Graduate Grading System.—*E* (excellent), *S* (satisfactory), *U* (unsatisfactory), *I* (incomplete), and *W* (authorized withdrawal).

QUALITY-POINT INDEX

Quality points are computed from grades as follows:

For each semester hour of the letter grade—*A*, 4 points; *B*, 3 points; *C*, 2 points; *D*, 1 point; *F*, no points.

Scholarship is computed in terms of the quality-point index. This is done by dividing the total number of quality points by the total number of semester hours for which the student has registered. Example: if a student received an *A* in one three-credit course, and a *B* in another three-credit course, he would compute his quality-point index in this way:

$$A = 4 \times 3 \text{ (semester hours)} = 12$$

$$B = 3 \times 3 \text{ (semester hours)} = 9$$

$$\frac{12}{6} = 2$$

$$\frac{21}{6} = 3.5 \text{ quality-point index}$$

Courses marked *W* or *I* are not considered in determining the index. If an *I* is not superseded by a proper grade within one calendar year, it is automatically computed as zero quality points. Grades in courses taken at other institutions are not considered in computing the quality-point index.

WARNINGS

At stated intervals during the academic year instructors file in the Office of the College of General Studies the names of those students taking courses with departmental numbers below 100, who are doing work of *D* grade or lower. A "warning" will then be sent to the student. A "warning" constitutes notice to the student that he must consult his instructor at the earliest opportunity. "Warning periods" are established during the seventh and eighth weeks of fifteen-week courses, and during the third and fourth weeks of eight-week courses.

PROBATION

A student must maintain a quality-point index of at least 2.00 or be placed on probation.

A student who has attempted 12 or more semester hours of work and whose quality-point index is between 1.50 and 2.00 will be placed on probation for the period in which he attempts 12 additional semester hours of work. If his quality-point index is still below 2.00 at the end of this probationary period he will be suspended. The Committee on Scholarship reserves the right to extend the period of probation even if the student has earned an average of above 2.00. A student placed on probation for a third period, whether successive or after an interval, will be suspended.

SUSPENSION

A student who has attempted 12 or more semester hours of work and whose quality-point index is below 1.50 is subject to suspension; however, a student who has a quality-point index between 1.40 and 1.50 will be considered by the Committee on Scholarship, which may retain him on probation or suspend him.

A student who is subject to probation for the third time, whether successive or after an interval, will be suspended.

A student suspended for poor scholarship may apply for readmission after an interval of one calendar year. In applying for readmission he must submit specific evidence to the Committee on Scholarship that he is better qualified to pursue college work. A student suspended twice for poor scholarship will not be readmitted.

READMISSION

A student who withdraws, is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return. Forms for readmission may be obtained from the Office of Admissions of the University. Complete and official transcripts from each institution the student has attended since making his previous application must be sent to the Office of the Director of Admissions before his application for readmission can be evaluated.

CHANGES IN PROGRAM OF STUDIES

DROPPING A COURSE OFF-CAMPUS

Courses meeting once or twice a week for $2\frac{1}{2}$ hours may be dropped without academic penalty during the first 10 class periods, and courses meeting once or twice a week for $1\frac{1}{4}$ hours may be dropped without academic penalty during the first 20 class periods.

Withdrawing from a course without academic penalty after the 10th or 20th class meeting, as the case may be, requires approval of a written request, which should be addressed to the Dean of the College of General Studies.

Procedure for dropping courses.—An *Off-Campus* drop slip (obtainable from the instructor, training officer, or the College of General Studies) must be filled out; signed and dated by the instructor; and submitted, in person or by mail, to the College of General Studies, 706 Twentieth Street NW., Washington 6, D. C.

Notifying an instructor of the intention to drop a course does *not* constitute an *official withdrawal*. Failure to follow the proper procedure will result in an automatic grade of F and, regardless of the time of discontinuance, will not relieve the student of financial responsibility for the entire course. (See "Refund of Fees" page 22.)

DROPPING A CAMPUS COURSE

A *Campus* drop slip (available at the Office of the Dean) must be filled out; signed and dated by the instructor; and submitted in person or by mail to the College of General Studies, 706 Twentieth Street NW., Washington 6, D. C.

Withdrawal between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

* The University work week is Monday through Friday, inclusive.

TRANSFER WITHIN THE UNIVERSITY

Transfer to the College of General Studies, as a degree candidate, from another college, school, or division of the University may be made only with the approval of the deans concerned. Application for transfer should be made on the transfer form, which is available at the Office of the Director of Admissions. An insert form, obtainable at the College of General Studies, must also be filled out. Upon transfer the student should consult the Dean and understand clearly the requirements he must fulfill.

A maximum of 45 semester hours is transferrable toward an Associate's degree; 90, toward a Bachelor's degree; and 12, toward a Master's degree. Students transferring within the University are advised to note the residence requirements of the degree sought.

CREDIT

Credit toward a degree is given only after regular registration for and satisfactory completion of the required work of classes in the University, or upon the granting of advanced standing in accordance with the regulations of the College of General Studies.

On request the Registrar will issue to the student a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

In special instances, a person who has been admitted to the University may be registered, with the permission of the instructor, as an "auditor" in a class (no academic credit). An auditor is not required to take active part in the exercises or to take examinations.

TRANSCRIPTS OF RECORD

Official transcripts of student records will be forwarded on request to other institutions. Unofficial copies of records will be issued to the student on request. No charge is made for the first copy; a fee of one dollar is charged for each one thereafter. No certificate of work done will be issued for a student who does not have a clear financial record.

GRADUATION REQUIREMENTS

To be recommended for graduation a student must have met the admission requirements of the College, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

Application for Graduation.—It is the student's responsibility to file an application for graduation when registering for the last semester of course work needed to complete the degree requirements. This form should be attached to the final registration forms or mailed to the College of General Studies. The graduation fee should not be included; the student will be billed by the Cashier prior to Commencement.

Scholarship.—The undergraduate must have a general quality-point index of 2.00. Candidates for the Bachelor's degrees must, in addition have a quality-point index of 2.50 in the major. The graduate student must have at least the grade of S (satisfactory) in all courses.

Curriculum.—See the requirements for the degree concerned.

Residence.—A student is "in residence" only when registered for course work after making application for admission to degree candidacy or for the 6 semester

hours undertaken to qualify for degree candidacy (see the specific residence requirements for the degree concerned).

The student who has completed his tuition requirements, but whose graduation is deferred for any reason, must maintain "in residence" status by paying the residence fee for the semester or summer session immediately preceding the graduation at which he expects to receive his degree.

If there is an interruption in the residence status, the student must apply for readmission to degree candidacy and meet any changes in curriculum which have been made since his original admission.

With the permission of the Dean, a student may be granted leave of absence; such student should, however, remain technically in residence by paying the residence fee for each semester he is absent. For the purpose of this regulation, the summer session will be disregarded.

By special arrangement, service personnel who receive military transfers when they are within 6 hours of a degree, may be permitted to complete their work elsewhere, transfer these credits to the College of General Studies, and receive a degree from this University. This procedure does not apply to Master's candidates who have been granted 6 hours of transferred credit.

Graduate Record Examination.—During the senior or final year candidates for the Bachelor's degrees in the College of General Studies are required to take the Graduate Record Examination: the Aptitude Test, which provides a measure of general scholastic ability at the graduate level; and Area Tests (achievement), which measure breadth of knowledge and understanding in three broad areas of the liberal arts: Natural Science, Social Science, and the Humanities. The examinations are conducted by the University twice a year: the Fall Testing Session (December 9, 1961) for students graduating in February, and the Spring Session (April 7, 1962) for those graduating in June or October.

As a part of registration for the final semester of undergraduate study, each student is responsible for applying for the Graduate Record Examinations. Application is to be made on the appropriate form and sent to the Assistant Dean, College of General Studies, together with a check or money order for \$10, made out to The George Washington University.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. By special permission, students who expect to graduate in June may take the Graduate Record Examination at the previous Fall Testing Session, so as to have transcripts available early in the year when applying for admission to graduate schools.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Thesis.—A thesis, submitted in partial satisfaction of requirements for the Master's degree, must be submitted in its final form to the Dean no later than the date specified in the calendar. Three complete copies of each thesis are required. It is the responsibility of the candidate for a graduate degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the thesis. These regulations are rigidly enforced. (See page 40.)

Accepted theses, with accompanying drawings, become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the Dean.

Presence at Graduation.—A candidate is required to be present at the graduation

exercises unless written application for graduation *in absentia* is approved by the Dean. The application should be in duplicate, should state the reason for the request, and give the address to which the diploma is to be sent. Petition for graduation *in absentia* should be received in the Office of the Dean at least two weeks prior to graduation.

HONORS

Dean's List.—To be eligible for inclusion on the Dean's List, a student must be a candidate for an undergraduate degree in the College of General Studies. Course work taken while the application for admission is being processed and the 6 semester hours required prior to making application will be computed in determining eligibility for the Dean's List. A full-time degree candidate must have a minimum quality-point index of 3.50 for the semester concerned; a part-time degree candidate must have a quality-point index of 3.50 on the last 12 semester hours of work and must have maintained continuous registration for at least one three-hour course during the period concerned. Eligibility for inclusion again will be determined on the basis of the subsequent 12 semester hours of work.

With distinction.—The undergraduate degrees may be conferred "with distinction", at the discretion of the Dean's Council of the College and the Committee on Scholarship of the University, if a student attains a quality-point index of 3.50 or higher on all work taken at this University. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

Special honors.—Special honors may be awarded to any member of the graduating class for outstanding achievement in the student's major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.
2. The student must meet such other conditions as may be set at the time his candidacy is approved.
3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.
4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

DISHONESTY

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Dean's Council) for subsequent registration in any unit of the University.

Evidence of dishonesty on the part of any student will result in his suspension from the University upon the recommendation of the Dean's Council.

A student found guilty of dishonesty will be deprived of credit for all courses in the semester during which the dishonest act occurs.

A student may apply to be readmitted in the semester or summer session which begins next after an interval of one year from the date of suspension.

THE LIBRARY

A student registered in the College of General Studies is entitled to the reference use of the University Library. The student receipt, issued upon the payment of tuition fees, must be presented as identification.

The loan period for most books available for home circulation is two weeks, with an additional two-week renewal. A fine of five cents will be charged for each day a book is overdue. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

COUNSELING

Students in the College of General Studies may obtain counseling and assistance in program planning in the offices of the College or from representatives of the Off-Campus Division at the installations and agencies at which courses are held. Appointments may be made by calling the College of General Studies: FEderal 8-0250, Extension 441, 486, or 437; or through the Education or Training Officer at individual installations. University counselors are also available at all installations and agencies during announced registration periods and, in some installations and agencies, at a scheduled time each month.

In addition, the services of The George Washington University Testing and Counseling Center are available to all students in the College of General Studies. The counseling services are designed to assist individuals in making educational and vocational plans. The program requires 30 hours of testing, scheduled in a series of three or four appointments. During this time, information concerning past experience, general ability, interest, personality, aptitudes, and achievement is obtained. Test results are interpreted and their implications discussed with the client. The Center is prepared to furnish related occupational and educational information. Clients are referred for specialized services when required. Follow-up is provided if requested.

The services offered by the Center include: aid in vocational choice; checking present training objectives; diagnosis of academic difficulties; checking suitability of present job; and special testing services, including General Educational Development Tests and Miller Analogies Test.

Fees.—Counseling Program: community clients under twenty-one years of age, \$35; community clients over twenty-one years of age, \$45; graduates of The George Washington University, \$30. For students who are currently registered as degree

students in the University, \$7.50; for students currently enrolled in the University but not as degree candidates, \$30. General Educational Development (college level) Battery, \$8; Individual, \$2; Miller Analogies Test, \$6. Fees for specialized testing are dependent upon the services involved.

All fees are payable at the time of testing at the Testing and Counseling Center. Appointments may be made by phone, mail, or in person. The Center is open from 9:00 to 5:00 Monday through Friday. The office is in Building N, 718 Twenty-first Street NW., Washington 6, D. C. Telephone: FEderal 8-0155 (or FEderal 8-0250, Extension 463).

THE ASSOCIATE'S DEGREES

Upon the satisfactory completion of the requirements of the College of General Studies, the terminal degree of Associate in Science or Associate in Secretarial Administration is conferred. The degree of Associate in Arts is optional.

Students who plan to continue working in this College toward the Bachelor's degree must apply to the Dean upon completion of requirements for the degree of Associate in Arts. Forms for this purpose are available at the Office of the Registrar and the College of General Studies.

After completing the College of General Studies requirements for the degree of Associate in Arts, students may wish to transfer to one of the other schools or colleges within the University, or they may wish to transfer to another institution. However, modifications in admission, advanced standing, and curriculum requirements permitted by the College of General Studies may not be accepted in transfer. Therefore, while registered in the College of General Studies, students should meet the requirements of the college or university to which they wish to transfer. The entrance requirements of the colleges and schools of the University are stated in the general catalogue of the University, which is available at the Office of the Director of Admissions.

ADVANCED STANDING

A maximum of 30 semester hours of advanced standing toward the degrees of Associate in Arts and Associate in Secretarial Administration may be earned, as explained in detail on page 20.

REQUIREMENTS FOR THE DEGREES

A minimum of 50 per cent of the work for the degree must be completed off campus; a maximum of 50 per cent may be completed on campus.

RESIDENCE

At least the last 15 semester hours for the degree must be completed while registered as a degree candidate (see pages 26-27) in the College of General Studies. In both the Off-Campus Division and the Campus Division, the 6 semester hours required prior to admission to degree candidacy are accepted in partial satisfaction of the residence requirement, if the courses are approved as part of student's degree program. (See page 19.)

SCHOLARSHIP

The system of grading and computing scholarship is described in detail on page 24. For regulations concerning probation, suspension, and readmission, see pages 24 and 25.

CURRICULUM

The satisfactory completion of 60 semester hours of college work in conformity with one of the following curricula is required.

The College of General Studies offers two flexible programs of study, of 60 semester hours each, leading to the degree of Associate in Arts and preparing for admission to candidacy for the degree of Bachelor of Arts. One is for students interested in a broad general education. The other curriculum prepares students for work in the field of Business Administration during the last two years of college.

ASSOCIATE IN ARTS CURRICULA

GENERAL CURRICULUM

The following curriculum leads to the degree of Associate in Arts and constitutes the first half of the General Curriculum leading to the degree of Bachelor of Arts. For the second half, see pages 35 and 36.

Faculty Adviser: Robert Whittington Eller, B.S., A.M. in Ed., Assistant Dean of the College of General Studies. Building F, Room 12 (706 Twentieth Street NW.), FEderal 8-0250, Extension 487 or 441.

| | Semester Hours |
|---|-------------------|
| English 1 or 1X-2: English Composition..... | 6 |
| English 41-42: Introduction to World Literature; 51-52: Introduction to English Literature; 71-72: Introduction to American Literature; or Philosophy 51-52: Introduction to Philosophy..... | 6 |
| *Foreign Language | 12 |
| Social Studies: from economics, history, political science, sociology and anthropology, or Geography 51 and 52. Six hours in one department are required, unless Political Science 9 and Sociology and Anthropology 1 are satisfied by the GED tests..... | 6 |
| Science: Chemistry 3-4: Fundamentals of Physical Science, or an introductory course in biology, botany, chemistry, geology, physics, or zoology (if arrangements cannot be made to offer such courses off campus, students may take these courses on campus)..... | 6 or 8 |
| Elective | 22 to 24 |
| Total..... | 60 |

BUSINESS ADMINISTRATION CURRICULUM

The following curriculum leads to the degree of Associate in Arts in the field of Business Administration and constitutes the first half of the curriculum leading to the degree of Bachelor of Arts with a Major in Business Administration. For the second half, see pages 36 and 37.

Faculty Adviser: James Carlton Dockeray, Ph.D., Professor of Finance and Executive Officer of the Department of Business and Public Administration. Building Y, Room 13 (802 Twentyfirst Street NW.), FEderal 8-0250, Extension 512

| | Semester Hours |
|--|-------------------|
| English 1 or 1X-2: English Composition..... | 6 |
| Accounting 1-2: Introductory Accounting..... | 6 |
| English 11: The Writing of Reports..... | 3 |
| *Foreign Language | 12 |
| Economics 1-2: Principles of Economics..... | 6 |
| Political Science 9-10: Government of the United States..... | 6 |
| Speech 1: Effective Speaking | 3 |

* A student offering for admission four acceptable high school units in one foreign language or two units in each of two foreign languages is not required to take any foreign language. (A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of classroom work.) If he offers two units only, he must complete the

| | |
|--|---------|
| †Statistics 51: Introduction to Business and Economic Statistics..... | 3 |
| †Statistics 52: Mathematics of Finance..... | 3 |
| Elective (Students interested in Foreign Commerce include Geography 51)..... | 9 or 12 |
| Total..... | 60 |

TERMINAL CURRICULA

In addition to the above curricula which prepare for Bachelor of Arts curricula, the following two-year terminal curricula are offered. They are designed for students who do not wish to extend their college education beyond two years.

ASSOCIATE IN ARTS CURRICULUM

In Accounting

The advanced standing possible in this curriculum is limited to English 2 and the 6 semester hours of electives, which may be earned by satisfactory scores on the appropriate GED tests. (See page 20.)

Faculty Adviser: Ralph Dale Kennedy, Ph.D., Professor of Accounting, Building N, Room 11 (718 Twenty-first Street NW.), FEderal 8-0250, Extension 243

| | Semester Hours |
|--|-------------------|
| Accounting 1-2: Introductory Accounting | 6 |
| Accounting 101: Cost Accounting | 3 |
| Accounting 111: Financial Statement Analysis..... | 3 |
| Accounting 121-22: Intermediate Accounting | 6 |
| Accounting 161: Income Tax Accounting..... | 3 |
| Accounting 171: Auditing | 3 |
| Accounting 181: Accounting Systems | 3 |
| Accounting 191: Advanced Accounting | 3 |
| Accounting 193: Business Budgeting | 3 |
| Business Administration 131: Business Finance | 3 |
| Business Administration 161: Commercial Law: Contracts, Sales, Agency, and Bailments | 3 |
| Business Administration 162: Commercial Law: Negotiable Instruments, Property, Mortgages | 3 |
| Economics 1-2: Principles of Economics..... | 6 |
| English 1 or 1X-2: English Composition | 6 |
| Elective (To be selected with the approval of the adviser)..... | 6 |
| Total..... | 60 |

Associate in Science Curriculum

The curriculum leading to the degree of Associate in Science in the field of Physical Sciences is offered at the Naval Engineering Experiment Station, Annapolis, Maryland, by the College of General Studies and on campus by the Columbian College of Arts and Sciences. Students who have taken courses in this curriculum at installations where the entire program is not available may, if they meet the en-

entire second-year college course in the same language or the first-year college course in another language. The usual college requirement is two years of a single language, but since many College of General Studies students may subsequently be stationed abroad, some familiarity with two foreign languages may be particularly useful. Therefore students may take one year each of two different foreign languages. Those who transfer to other institutions will probably have to take two years of one language and should be guided accordingly.

The high school units accepted under the above arrangements remove the college language requirement, but do not count for college credit.

† Statistics 51 is offered on campus only. However, Statistics 101 and 102 *Basic Principles of Statistical Methods I and II* (3-3), which are offered off campus, may be substituted.

‡ Statistics 52 is offered on campus only. However, Statistics 58 *Mathematics of Business Administration* (3), which is offered off campus, may be substituted.

trance requirements, transfer to Columbian College of Arts and Sciences to complete the curriculum.

No credit toward the degree will be granted for GED tests, service schools, correspondence schools, or validating examinations. All students interested in continuing the study of physical science toward a Bachelor's degree should consult the Dean or Assistant Dean of the College of General Studies.

Faculty Adviser: Robert Whittington Eller, B.S., A.M. in Ed., Assistant Dean of the College of General Studies. Building F, Room 12 (706 Twentieth Street NW.), FEderal 8-0250, Extension 441 or 487

| | Semester Hours |
|--|-------------------|
| Chemistry 11-12: General Chemistry | 8 |
| Chemistry 21: Qualitative Inorganic Analysis..... | 4 |
| English 1 or 1X-2: English Composition..... | 6 |
| English 11: The Writing of Reports..... | 3 |
| *Mathematics 3: College Algebra | 3 |
| *Mathematics 6: Plane Trigonometry | 3 |
| Mathematics 12: Analytic Geometry | 3 |
| Mathematics 29: Calculus I | 3 |
| Mathematics 30: Calculus II | 3 |
| Mathematics 31: Calculus III | 3 |
| Mechanical Engineering 10: Graphical Communications..... | 2 |
| Physics 11, 12, 13: Introductory Physics..... | 9 |
| Physics 16: General Physics | 3 |
| Physics 55: Physical Measurements | 3 |
| Electives (Speech 1: Effective Speaking (3) and Economics 1-2: Principles of Economics (6) are recommended)..... | 4 |
| Total..... | 60 |

Associate in Secretarial Administration Curriculum

This curriculum is designed for secretarial students who, in addition to obtaining the degree of Associate in Secretarial Administration, wish to prepare for the Certified Professional Secretaries' Examination for the certificate issued by the Institute for Certifying Secretaries, a body of the National Secretaries Association, International.

Advanced standing may be granted upon successful completion of the General Educational Development Tests numbers 1 and 4; validating examinations; service school courses, as evaluated by the United States Armed Forces Institute Guide; and approved correspondence courses of college level. (See page 20.)

The status of applicants with academic work taken at another institution will be established on application for degree candidacy.

Faculty Adviser: Mildred Hollander Shott, A.M., Associate Professor of Secretarial Studies. Monroe Hall, Room 300 (2115 G Street NW.), FEderal 8-0250, Extension 447

| | Semester Hours |
|--|-------------------|
| Accounting 1-2: Introductory Accounting | 6 |
| Business Administration 102: Fundamentals of Management..... | 3 |
| Business Administration 109: Office Management | 3 |
| Economics 1-2: Principles of Economics..... | 6 |
| English 1 or 1X-2: English Composition | 6 |
| English 41-42: Introduction to World Literature; | |
| English 51-52: Introduction to English Literature; or | |
| English 71-72: Introduction to American Literature..... | 6 |

* The Mathematics 3 requirement may be satisfied by two years of acceptable high school algebra; the Mathematics 6 requirement, by one-half year of high school trigonometry.

| | |
|---|----|
| Psychology 1: General Psychology | 3 |
| Secretarial Studies 2: Intermediate Typewriting | 3 |
| Secretarial Studies 11: Elementary Shorthand and Transcription..... | 3 |
| Secretarial Studies 12: Intermediate Shorthand and Transcription..... | 3 |
| Secretarial Studies 15: Advanced Shorthand, Typewriting, and Transcription | 3 |
| Secretarial Studies 16: Secretarial Shorthand, Typewriting, and Transcription | 3 |
| Secretarial Studies 51: Business Correspondence | 3 |
| Secretarial Studies 54: Secretarial Practice | 3 |
| Speech 1: Effective Speaking or Speech 11: Voice and Diction..... | 3 |
| Statistics 51: Introduction to Business and Economic Statistics (3), or Statistics 101: Basic Principles of Statistical Methods I (3) | 3 |
| Total..... | 60 |

THE BACHELOR'S DEGREES

Upon the satisfactory completion of the requirements of the College of General Studies, the degree of Bachelor of Arts or Bachelor of Science in Cartography is conferred.

BACHELOR OF ARTS

The College of General Studies offers curricula leading to the degree of Bachelor of Arts in: (1) the General Curriculum; (2) Business Administration; and (3) departmental majors available to students in Columbian College of Arts and Sciences or the School of Government, Business, and International Affairs. Many courses required for departmental majors are available only on campus.

REQUIREMENTS FOR ADMISSION TO CANDIDACY

The degree of Associate in Arts in the College of General Studies, or the equivalent, and the permission of the Dean (see page 19) are required. Admission to Bachelor's candidacy after receiving the degree of Associate in Arts is not automatic. With the permission of the Dean, students with limited deficiencies in the requirements for admission may be conditionally admitted to degree candidacy while they make up academic deficiencies.

Students with acceptable college records from other institutions must complete 6 semester hours, with the grade of C or better, before applying for degree candidacy.

Students with questionable previous college records may be accepted on probation in an "unclassified" status, to complete 24 semester hours, with the grade of C or better, before final consideration of degree candidacy.

A conference concerning plans for study is required of each applicant for admission to candidacy. Appointments may be made with the Assistant Dean or the Director of the Off-Campus Division by telephone (FEDeral 8-0250, Extension 441 or 487) or by letter.

Advanced Standing

In addition to credit allowed in transfer from other accredited colleges or universities, see "From Higher Institutions", page 19, advanced standing may be obtained by the following methods.

1. By validating examinations, service schools, and correspondence courses. From any combination of these sources, the maximum credit that may be obtained is 15 semester hours. The maximum credit obtained from any one of these sources may not exceed that stated on page 20. No credit may be obtained in this way, however, if the student has been credited with the maximum of 30 semester hours toward the degree of Associate in Arts.

2. By GED tests. Advanced standing is limited to students registered in the General Curriculum or the Business Administration Curriculum and is granted only for courses in the Associate in Arts Curriculum (page 32) which are prerequisite to advanced courses in the student's Bachelor's program.

REQUIREMENTS FOR THE DEGREE

Degree candidates in the Off-Campus Division must complete at least 50 per cent of the work taken at this University in off-campus courses.

Residence

The last 30 semester hours, including at least 12 hours in the major field, must be completed in residence in the College, unless special permission is granted by the Dean to take work elsewhere. This requirement applies to students transferring within the University as well as to students transferring from other institutions. Summer work and the 6 hours required prior to admission to degree candidacy (if approved as part of the degree program) may be counted in residence, but in no case may the period of residence aggregate less than 30 weeks. For regulations governing military students who are transferred when they are within 6 semester hours of their degree, see page 27.

Transfers.—Transfer students from other universities who have partially or substantially met the major requirements are required to complete satisfactorily 12 semester hours of approved work in the major field in the College of General Studies. This work will count as part of the minimum (30 semester hours) residence requirement. (For regulations concerning transfer within the University, see page 26.)

Scholarship

The system of grading and computing scholarship is described in detail on pages 23-24. For regulations concerning probation, suspension, and readmission, see pages 24-25. To remain in good standing, a student must maintain a general quality-point index of 2.00 and a quality-point index of at least 2.50 in his major.

Curriculum

In addition to the requirements for the degree of Associate in Arts, the satisfactory completion of 60 semester hours, as set forth in one of the following curricula, is required.

GENERAL CURRICULUM

Preregistration counseling is recommended to adapt this curriculum to the student's objectives or employment responsibilities and aims. For appointments call the College of General Studies, FEderal 8-0250, Extension 441.

Students planning to work toward a Master's degree in Columbian College of Arts and Sciences; the School of Government, Business, and International Affairs; or the School of Education are advised to plan their programs of study toward the Bachelor's degree so that they will meet the prerequisite requirements of the school or college of their choice.

Candidates for the degree of Bachelor of Arts registered in the General Curriculum select courses, approved by the Dean or Assistant Dean, from two of the following divisions, one of which constitutes the major and the other the minor.

Faculty Adviser: Robert Whittington Eller, B.S., A.M. in Ed., Assistant Dean of the College of General Studies. Building F, Room 12 (706 Twentieth Street NW.), FEderal 8-0250, Extension 487 or 441

1. *The Division of Languages and Literatures.*—The departments of Classical Languages and Literatures, English, Germanic Languages and Literatures, Journalism, Romance Languages and Literatures, and Slavic Languages and Literatures.
2. *The Division of Mathematics and Physical Sciences.*—The departments of Chemistry, Geology, Mathematics, Physics, and Statistics.
3. *The Division of the Natural Sciences.*—The departments of Biology, Botany, Microbiology, Physiology, Psychology, and Zoology.
4. *The Division of the Social Sciences.*—The departments of Accounting, Business and Public Administration, Economics, Education, Geography, History, Philosophy, Political Science, Religion, Sociology and Anthropology, and Speech.

| | Semester Hours |
|--|-------------------|
| Major division | 24 |
| (Courses are to be selected, with the approval of the adviser, from appropriate fields of study listed in the student's major division. Eighteen of the required 24 hours must be in courses with departmental numbers above 100.) | |
| Minor division | 12 |
| (Courses are to be selected, with the approval of the adviser, from appropriate fields of study listed in the student's minor division.) | |
| Elective | 24 |
| Total (of which at least 30 semester hours must be in courses with departmental numbers above 100) | 60 |

BUSINESS ADMINISTRATION CURRICULUM

Faculty Adviser: James Carlton Dockeray, Ph.D., Professor of Finance and Executive Officer of the Department. Building Y, Room 13 (802 Twenty-first Street NW.), FEderal 8-0250, Extension 512

| | Semester Hours |
|--|-------------------|
| Accounting 193: Business Budgeting | 3 |
| Business Administration 101: Introduction to Business..... | 3 |
| Business Administration 102: Fundamentals of Management..... | 3 |
| Business Administration 105: Personnel Management | 3 |
| Business Administration 131: Business Finance | 3 |
| Business Administration 141: Principles of Marketing..... | 3 |
| Business Administration 161: Commercial Law: Contracts, Sales, Agency, and Bailments | 3 |
| Business Administration 162: Commercial Law: Negotiable Instruments, Property, Mortgages | 3 |
| Business Administration 198: Case Problems in Management..... | 3 |
| Economics 121: Money and Banking..... | 15 |
| Group Option..... (To be selected from one of the following groups)..... | 15 |
| *Elective | 60 |
| Total..... | |

† *Group Option.*—The selection of the option and the courses (15 semester hours) to be taken in it must be made in consultation with the faculty adviser. Normally no more than 6 semester hours may be taken in an option other than the one selected. Consent of the adviser must be obtained if the student wishes such modification of his option group.

Group I—General Business

Composed of courses in Accounting, Business and Public Administration, Economics and Statistics.

* To be selected in consultation with the Executive Officer of the Department of Business and Public Administration.

† Lists of courses suggested for each option may be obtained from the Assistant Dean of the College of General Studies or the Executive Officer of the Department of Business and Public Administration.

Group II—Personnel Management

Composed of courses in Business and Public Administration, Economics, Psychology, Speech, and Statistics.

Group III—Finance

Composed of courses in Accounting, Business and Public Administration, Economics, Political Science, and Statistics.

Group IV—Marketing

Composed of courses in Business and Public Administration, Economics, Geography, and Statistics.

Group V—Controllorship

Composed of courses in Accounting, Business and Public Administration, and Economics.

Group VI—Economics

Composed of courses in Economics and Business and Public Administration.

Group VII—Statistics

Composed of courses in Statistics.

Group VIII—Transportation and Public Utilities

Composed of courses in Business and Public Administration, Economics, Geography, History, and Statistics.

Foreign Commerce.—Business Administration majors who wish to specialize in foreign commerce may request a modification of the above requirements. The modified major excludes some of the above required courses and adds others, such as a third year of foreign language, foreign markets, exporting and importing, economic geography, and other courses relating to overseas trade. Each program must be approved by the adviser.

DEPARTMENTAL MAJOR

Students who elect a major of the type offered in Columbian College of Arts and Sciences and the School of Government, Business, and International Affairs should consult the University catalogue for the major requirements. Any deviation from these major requirements must be approved by the Executive Officer of the department concerned and the Dean of the College of General Studies.

BACHELOR OF SCIENCE IN CARTOGRAPHY

The College of General Studies offers a four-year curriculum designed to prepare students for the degree of Bachelor of Science in Cartography.

ENTRANCE REQUIREMENTS

The entrance requirements are the same as those stated on pages 18-19, with the exceptions noted below under "Advanced Standing".

Advanced Standing

Twenty-four semester hours of credit may be granted upon the successful completion of validating examinations. No credit will be given for GED tests, correspondence schools, or service school courses.

REQUIREMENTS FOR THE DEGREE

The residence and scholarship requirements for the degree of Bachelor of Science in Cartography are the same as those stated above for the degree of Bachelor of Arts.

Curriculum

To be recommended by the faculty for graduation, candidates for the degree of Bachelor of Science in Cartography are required to complete the following curriculum of 126 semester hours.

Faculty Adviser: Robert John Alexander, M.S., Lecturer in Cartography. Building I, Room 202 (2135 G Street, N.W.), FEderal 8-0250, Extension 287 or 298

| | Semester Hours |
|--|-------------------|
| Cartography 1: Map Interpretation | 3 |
| Cartography 11: Cartographic Drafting and Descriptive Geometry..... | 2 |
| Cartography 12: Topographic Surveying | 3 |
| Cartography 13: Higher Surveying | 3 |
| Cartography 17-18: Elementary Photogrammetry | 6 |
| Cartography 110: Map Projections | 3 |
| Cartography 111: Map Reproduction | 3 |
| Cartography 155: Elements of Geodesy | 3 |
| Cartography 156: Geodetic Astronomy | 3 |
| Cartography 160: Theory of Errors and Geodetic Adjustments..... | 6 |
| Cartography 191-92: Map and Chart Construction..... | 6 |
| Chemistry 11-12: General Chemistry | 8 |
| English 1 or IX: English Composition | 3 |
| English 2: English Composition | 3 |
| English 11: The Writing of Reports..... | 3 |
| Geography 51: Introduction to Geography | 3 |
| Geography 52: World Regions | 3 |
| Geography 115-16: Physical Geography | 6 |
| Geography 124: Land Capabilities | 3 |
| Geography 125: Transportation Complexes | 3 |
| Geology 105-6: Fundamentals of Geophysics..... | 6 |
| Mathematics 12: Analytic Geometry | 3 |
| Mathematics 29: Calculus I | 3 |
| Mathematics 30: Calculus II | 3 |
| Mathematics 31: Calculus III | 3 |
| Mathematics 111: Mathematics for Engineers and Physicists I..... | 3 |
| Mathematics 112: Mathematics for Engineers and Physicists II..... | 3 |
| Oceanography 101-2: Introductory Oceanography | 6 |
| Physics 11: Introductory Physics | 3 |
| Physics 14: General Physics | 3 |
| Physics 15: General Physics | 3 |
| Physics 16: General Physics | 3 |
| Social Studies: (any one of the following two-semester courses)..... | 6 |
| Economics 1-2: Principles of Economics (3-3) | |
| History 39-40: The Development of European Civilization (3-3) | |
| History 71-72: The Development of the Civilization of the United States (3-3) | |
| Political Science 9-10: Government of the United States (3-3) | |
| Sociology and Anthropology 1-2: Man in Modern Society (3-3) | |
| Elective | 12 |
| Total..... | 130 |

THE MASTER'S DEGREES

Master of Arts curricula in the fields of Controllershship, Governmental Administration, and Personnel Management are offered for adults with successful work experience who find it essential to take most of their graduate studies off-campus. This program is available in the Main Navy Building, the Pentagon, Fort Monroe, Fort Eustis, Langley Air Force Base, Annapolis, and the Naval Supply Center at Norfolk; and it will be offered elsewhere as the demand warrants. Additional curricula will be established when the need becomes apparent.

All the work in these three curricula may be taken off-campus. If it should become necessary, up to 50 per cent of the courses may be taken on campus. In all cases the University standards for graduate study are maintained.

A curriculum leading to the degree of Master of Arts in International Affairs is offered for the students and faculty of the Army War College and the National War College.

A curriculum leading to the degree of Master of Business Administration is offered only for the students and faculty at the Industrial College of the Armed Forces.

The programs in International Affairs and Business Administration are offered only at these military installations or in the Campus Division of the College of General Studies. (See pages 43-44 and 47-48, 59, 60.)

Graduate students who plan to work toward Master's degrees in another school or college of the University may enroll for graduate courses in the Off-Campus Division, with the approval of the dean of the school or college in which they are enrolled. In the School of Government, Business, and International Affairs and the School of Education, a maximum of 6 hours of *approved* off-campus work will be accepted at the time of matriculation for the degree and 6 additional hours of approved courses will be permitted off-campus after matriculation.

COUNSELING SERVICE

An advisory service, which is the joint responsibility of the agency sponsoring the program and the University, is available to all Master's candidates. Regular members of the Faculty of the University are available as curriculum advisers in the various specialized fields.

REQUIREMENTS FOR ADMISSION TO DEGREE CANDIDACY

To be admitted to degree candidacy the applicant must have (1) an approved Bachelor's degree (120 semester hours, which conform essentially to the requirements for a Bachelor's degree in the College of General Studies) from an accredited higher institution; (2) credit (totaling 6 semester hours), with the grade of *B* (undergraduate) or *S* (graduate), for two courses approved by the academic adviser and taken in the College of General Studies prior to admission to candidacy*; and (3) a quality-point index of 3.00 (*B*) in the undergraduate major. If the applicant's work history gives evidence of more competence than his previous academic record indicates, he may be admitted to candidacy on the basis of satisfactory completion of 12 semester hours of work approved by his academic adviser, acceptable results of scholastic aptitude tests, or both.*

ADVANCED STANDING*

A maximum of 6 semester hours of advanced standing may be credited toward the degree by transfer of credit for approved graduate work taken at an accredited college or university.

REQUIREMENTS FOR THE DEGREES

RESIDENCE*

Of the 30 semester hours of graduate work required for the degree, a minimum of 24, which may include the thesis (6 semester hours), must be completed while registered as a degree candidate in the College of General Studies, except in the case of transfers within the University, who are required to have 12 hours of residence in the College of General Studies as degree candidates.

* Not applicable to candidates for the degrees of Master of Arts in International Affairs or Master of Business Administration.

SCHOLARSHIP

The grade of at least *S* (satisfactory) in all courses is required.

A student whose scholarship is unsatisfactory may be suspended by the Dean upon recommendation of the faculty adviser and the approval of the Committee on Scholarship. A Master's candidate who accumulates 9 semester hours or more of *U* (unsatisfactory) (including grades of *C* or lower in the prerequisite courses) will be automatically suspended. For information concerning the system of grading, pages 23-24.

THESIS

Theses are required of candidates for the degrees of Master of Arts in International Affairs and Master of Business Administration.

With the approval of the adviser, a thesis may be substituted for six hours of elective credit toward the degree of Master of Arts in the fields of Controllorship, Governmental Administration, and Personnel Management. (See page 27.)

The thesis subject must be approved by the director of the thesis and the faculty adviser and presented to the Dean no later than the date announced in the calendar.

The thesis in its final form must be approved by the director of the thesis and the faculty adviser and presented to the Dean no later than the date announced in the calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis are available in the Office of the Dean.

Payment of tuition for the thesis entitles the candidate, during the academic year of registration, to the advice and direction of the member of the faculty under whom the thesis is to be written. In case a thesis is unfinished an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If preparation of the thesis extends beyond the two-year period the student must register for it again and pay tuition on the same basis as for a repeated course.

COURSE SUBSTITUTION

It is the responsibility of the student to get from the faculty adviser and the Dean the written approval required for course substitutions in any of the Master's curricula. Forms for requesting course substitution are available at the College of General Studies.

COMPREHENSIVE EXAMINATIONS

The Master's candidate is required to pass a written Comprehensive Examination. The examinations are conducted at the University three times each year: December 1 and 2 for students graduating in February; March 30 and 31 for students graduating in June, and July 6 and 7 for students graduating in October. At the time of the examination he may be required to submit to the examination committee copies of articles published, pertinent staff studies, reports, etc., prepared during the period of graduate study, as additional evidence of Master's competency.

MASTER OF ARTS CURRICULA

CONTROLLERSHIP

Faculty Adviser: Arlin Rex Johnson, Ph.D., Professor of Business Administration.
Hall of Government, Room 206 (710 Twenty-first Street NW.), Federal 8-0250, Extension 493

A. Prerequisite

In addition to the general requirements for admission to candidacy for

the degree of Master of Arts, candidates are expected to have an undergraduate background in the social sciences. Students lacking this academic background may, with the approval of the adviser, substitute work experience. At least one approved course in each of the following fields is required: Accounting, Business and Public Administration, and Economics. Additional course work may be prescribed.

| B. Required Courses | | Semester Hours |
|---|--|-------------------|
| Accounting 211-12: Managerial Accounting | | 6 |
| Business Administration 261: Seminar in Advanced Management..... | | 3 |
| Business Administration 268: Management Engineering | | 3 |
| Business Administration 296: Seminar in Controllershship..... | | 3 |
| Psychology 145: Principles of Human Relations..... | | 3 |
| Public Administration 213: Administration in Government..... | | 3 |
| Public Administration 251: Governmental Budgeting | | 3 |
| Public Administration 252: Seminar in Planning and Programming..... | | 3 |
| Statistics 101: Basic Principles of Statistical Methods I..... | | 3 |
| Total..... | | 30 |
| C. Elective | | 6 |

A student whose previous academic preparation makes it unnecessary for him to take all the prescribed courses in this program may substitute elective courses with the written approval of his faculty adviser. A form for the purpose is available at the College of General Studies. Electives may be selected from the Governmental Administration or the Personnel Management Master's program. In exceptional cases, the faculty adviser may approve other courses as electives. Also included among the possible electives is Business Administration 299-300: Thesis (3-3).

GOVERNMENTAL ADMINISTRATION

Faculty Adviser: Waldo Sommers, Ph.D., Associate Professor of Public Administration.
Hall of Government, Room 205 (710 Twenty-first Street NW.), Federal
8-0250, Extension 404 or 540

A. Prerequisite

In addition to the general requirements for admission to candidacy for the degree of Master of Arts, candidates are expected to have an undergraduate background in the social sciences or business administration. Students lacking this academic background may, with the approval of the adviser, substitute work experience. At least one approved course in each of the following fields is required: Business and Public Administration, Economics, and Psychology. Additional course work may be prescribed.

| B. Required Courses | | Semester Hours |
|---|--|-------------------|
| Business Administration 268: Management Engineering | | 3 |
| Psychology 146: Psychology of Human Relations..... | | 3 |
| Public Administration 210: The Management Function..... | | 3 |
| Public Administration 213: Administration in Government..... | | 3 |
| Public Administration 231: Public Personnel Management..... | | 3 |
| Public Administration 237: Intermediate Management and Supervision..... | | 3 |
| Public Administration 251: Governmental Budgeting | | 3 |
| Public Administration 252: Seminar in Planning and Programming..... | | 3 |

| | |
|---|-----------|
| Public Administration 260: Seminar in Policy Formulation and Administration | 3 |
| Elective | 3 |
| Total | 30 |

C. Elective

In addition to the elective of 3 semester hours listed above, a student whose previous academic preparation makes it unnecessary for him to take all the prescribed courses in this program may substitute elective courses, with the written approval of his faculty adviser. A form for the purpose is available at the College of General Studies. Electives may be selected from the courses listed under the Controllorship and Personnel Management Master's programs. In exceptional cases, the faculty adviser may approve other courses as electives. Also included among the possible electives is Public Administration 299-300: Thesis (3-3).

PERSONNEL MANAGEMENT

Faculty Adviser: Joe Lee Jessup, M.B.A., Professor of Business Administration, Monroe Hall, Room 3-A (2115 G Street NW.), Federal 8-0250, Extension 543

A. Prerequisite

In addition to the general requirements for admission to candidacy for the degree of Master of Arts, candidates are expected to have an undergraduate background in the social sciences. Students lacking this academic background may, with the approval of the adviser, substitute work experience. At least one approved course in each of the following fields is required: Business and Public Administration, Economics, Psychology, and Statistics. Additional course work may be prescribed.

B. Required Courses

| | |
|---|------------------------|
| Psychology 144: Personnel Psychology | Semester Hours 3 |
| Psychology 246: Seminar: Personnel Measurement Techniques (Prerequisite: Psychology 144, and an elementary course in Statistics)..... | 3 |
| Public Administration 213: Administration in Government..... | 3 |
| Public Administration 231: Public Personnel Management..... | 3 |
| Public Administration 232: Personnel Procedures and Problems..... | 3 |
| Public Administration 237: Intermediate Management and Supervision..... | 12 |
| Elective | |
| Total | 30 |

C. Elective

Elective courses should be selected, after consultation with the faculty adviser, from the following, which will be provided off-campus according to the polled interests of the students. The selection of electives not included in this list must have the written approval of the faculty adviser. A form for the purpose is available at the College of General Studies.

| | |
|--|------------------------|
| Business Administration 286: Management in the Armed Forces..... | Semester Hours 3 |
| Economics 241: Labor Economics | 3 |
| Economics 244: Collective Bargaining | 3 |
| Psychology 127: Employee Counseling | 3 |
| Psychology 146: Psychology of Human Relations..... | 3 |
| Psychology 245: Seminar: Employee Motivation and Morale..... | 3 |

| | |
|---|---|
| Psychology 247: Applications of Behavioral Research Methods to Personnel Management | 3 |
| Public Administration 233: Seminar in Manpower Development and Utilization | 3 |
| Public Administration 251: Governmental Budgeting | 3 |
| Public Administration 260: Seminar in Policy Formulation and Administration | 3 |
| Speech 121: Group Discussion and Conference Leadership..... | 3 |
| Also one of the following courses may be used as an elective depending on the interest and background of the candidate: | |
| Business Administration 299-300: Thesis | 6 |
| Psychology 299-300: Thesis | 6 |
| Public Administration 299-300: Thesis | 6 |

THE DEGREE OF MASTER OF ARTS IN INTERNATIONAL AFFAIRS

Faculty Adviser: John Withrow Brewer, Ph.D., Professor of International Law.
Hall of Government, Room 204 (710 Twenty-first Street, NW.), Federal 8 0250, Extension 240

This is a special degree program offered in cooperation with the Army War College, Carlisle Barracks, Pennsylvania, and the National War College, Fort McNair, Washington, D. C. It is open only to current students and faculty and to graduates of the classes of 1956 through 1960 of these colleges.

A. Prerequisite

A Bachelor's degree consisting of a minimum of 120 semester hours from an accredited college or university.

B. Required Courses

| | Semester Hours |
|--|-------------------|
| Political Science 260: Fundamentals of National Power..... | 3 |
| Political Science 261: International and United States Foreign Policy..... | 3 |
| Political Science 262: National Security Policy of the United States..... | 3 |
| Political Science 299-300: Thesis | 6 |
| C. Elective courses (from the following or related courses as approved by the faculty adviser) | 15 |

Economics 251: Theories of Economic Development (3)

History 246: Seminar in Eurasian History (3)

Political Science 172: International Organization: the United Nations (3)

Political Science 212: Seminar: Comparative Government (3)

Political Science 275: Political, Geographic, and Economic Factors in Latin American Development (3)

Political Science 283: Topics in International Law (3)

Political Science 285: Diplomacy Since World War II (3)

Psychology 263: Intercultural Change: a Psychological and Behavioral Approach (3)

Total..... 30

THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION

Faculty Adviser: James Carlton Dockeray, Ph.D., Professor of Finance and Executive Officer of the Department. Building Y, Room 13 (802 Twenty-first Street, NW.), Federal 8-0250, Extension 512

This is a special degree program offered in cooperation with the Industrial College of the Armed Forces, Fort McNair, Washington, D. C. It is open only to current students and faculty and to graduates of the classes of 1956 through 1960 of the Industrial College of the Armed Forces.

A. Prerequisite

A Bachelor's degree consisting of a minimum of 120 semester hours from an accredited college or university.

| | Semester Hours |
|---|-------------------|
| B. Required Courses | |
| Business Administration 201: Advanced Management | 3 |
| Business Administration 268: Management Engineering (3), or | |
| Business Administration 296: Seminar in Controllershship (3) | 3 |
| Business Administration 290-81-82: Managerial Aspects of National Security | 9 |
| Business Administration 299-300: Thesis | 6 |
| Economics 217: Survey of Economics | 3 |
| C. Elective Courses (from the following or related courses as approved by the faculty adviser) | 6 |
| Business Administration 218: Survey of Data Processing (3) | |
| Business Administration 237: Security Analysis (3) | |
| Business Administration 263: Business Organization and Management (3) | |
| Business Administration 275: Human Relations in Business (3) | |
| Economics 218: Survey of Economics (3) | |
| Economics 219: Managerial Economics (3) | |
| Total | 30 |

OFF-CAMPUS CENTERS

The College of General Studies, through its Off-Campus Division, has offered programs in the various governmental and Armed Forces Installations listed below:

CIVIL SERVICE COMMISSION, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: William A. Hammill, Director of Personnel; John A. Simmons, Personnel Manager Supervisor

Building: Main Building, 8th and F Streets NW., Room 223 (Mr. Hammill);
Room 217 (Mr. Simmons)

Telephone: DUnkirk 6-3484 (Mr. Hammill); DUnkirk 6-6120 (Mr. Simmons)

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Civil Service Commission and to personnel of other government agencies by permission

DEPARTMENT OF COMMERCE

BUREAU OF THE CENSUS, WASHINGTON 25, D. C.

Training Officers: John Vawter, Chief, Personnel Standards and Development Branch, Personnel Division; Mrs. Dorothy Paul Pritzker, Training Officer (General Field), Personnel Division

Building: FOB 3, Room 1370, Suitland, Maryland

Telephone: REdwood 5-2000, Extension 500

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate courses leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks

Open to all employees of the Bureau of the Census and the Naval Hydrographic Office, and to other government employees by permission

BUREAU OF FOREIGN COMMERCE, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: Donald O. Hayes, Career Development Officer; Mrs. Jane deLauder, Assistant Career Development Officer

Building: Commerce Department Building, Room 1061, 14th Street and Constitution Avenue NW.

Telephone: WOrth 7-3506 (Mr. Hayes); WOrth 7-4233 (Mrs. deLauder)

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of Commerce and to personnel of other government agencies by permission

BUSINESS AND DEFENSE SERVICES ADMINISTRATION, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: John E. Taylor, Chief, Employment Branch; Mrs. Della A. Young, Training Adviser

Building: Commerce Department Building, Room 4845, 14th Street and Constitution Avenue NW.

Telephone: WOrth 7-3946 (Mr. Taylor); WOrth 7-4012 (Mrs. Young)

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of Commerce and to personnel of other government agencies by permission

COAST AND GEODETIC SURVEY, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: Mrs. Muriel Christgau, Training Branch, Personnel and Safety Division; Mr. Robert C. Czapiewski, Employee Development Officer

Building: Commerce Department Building, Room 2009, 14th Street and Constitution Avenue NW.

Telephone: WOrth 7-5034

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate courses leading to the degrees of Associate in Arts, Bachelor of Arts, and Bachelor of Science in Cartography

Length of Courses: Fifteen weeks

Open to all employees of the Bureau of the Census and the Naval Hydrographic Office and to other government employees by permission

NATIONAL BUREAU OF STANDARDS, WASHINGTON 25, D. C.

Registrar: Mrs. Virginia Maxwell

Building: The Manse, Room 102, Connecticut Avenue and Van Ness Street NW.

Telephone: EMerson 2-4040, Extension 366 or 7400

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks

Open to all employees of the National Bureau of Standards—also to all employees of other government agencies and to all American citizens, providing they meet the formal prerequisites

PATENT OFFICE, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Willis Hokans, Employee Development Officer

Building: Commerce Department Building, Room 3625, 14th Street and Constitution Avenue NW.

Telephone: WOrth 7-2871

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of Commerce and to personnel of other government agencies by permission

WEATHER BUREAU, WASHINGTON 25, D. C.

Training Officer: Albert V. Carlin, Chief, Training Section

Building: Main Administration Building, Room 108, 24th and M Streets NW.

Telephone: ADams 2-3200, Extension 285

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Graduate courses in meteorology

Length of Courses: Fifteen weeks

Open to all government employees by permission of the Weather Bureau

DEPARTMENT OF DEFENSE

THE PENTAGON, WASHINGTON 25, D. C.

After-hours Training Program: John G. Boswell, Coordinator for the University

Room: Reception center on the Concourse

Telephone: OXford 7-3141 or FEderal 8-0250, Extension 487, 441

Type of Course Offered: Undergraduate courses leading to the degrees of Associate in Arts, Associate in Secretarial Administration, and Bachelor of Arts; graduate program leading to the degree of Master of Arts in the fields of Controllorship, Governmental Administration, and Personnel Management

Length of Courses: Fifteen weeks in Fall and Spring semesters; eight weeks in the Summer Sessions

Restricted to military and civilian personnel of the Department of Defense

DEPARTMENT OF THE AIR FORCE

Langley Air Force Base, Virginia

Educational Consultant: Robert J. Dewey

Building: T-238

Telephone: PArk 2-7911, Extension 24120

Coordinator for the University: John G. Boswell

Telephone: FEderal 8-0250, Extension 441

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate courses leading to the degree of Master of Arts in the field of Personnel Management

Length of Course: Eight weeks and fifteen weeks

Open to military and civilian employees of the Air Force and to other government employees, by permission of the Commanding Officer of Langley Air Force Base

DEPARTMENT OF THE ARMY

Army Map Service, Washington 25, D. C.

Training Officer: Jerome E. McClain

Building: Erskine Hall, 6500 Brooks Lane NW.

Telephone: OLiver 4-4350, Extension 587

Coordinator for the University: John G. Boswell

Telephone: FEderal 8-0250, Extension 441

Type of Course Offered: Undergraduate program leading to the degree of Bachelor of Science in Cartography

Length of Courses: Fifteen weeks

Open to employees of the Army Map Service and other government employees by permission of the Commanding Officer of the Army Map Service.

Army Security Agency, Arlington, Virginia

Education Officer: Anthony F. Chrzanowski

Building: T-300

Telephone: JACkson 5-5800, Extension 772

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Eight and fifteen weeks

Open to employees of the Army Security Agency

Army War College, Carlisle Barracks, Pennsylvania

Project Officer: Col. Harold E. Nelson, USA

Building: Root Hall, Room 204

Telephone: CHapel 3-4141, Extension 221

Coordinator for the University at Carlisle Barracks: C. Edward Galbreath, Director,
Army War College Center

Building: Root Hall, Room 114

Telephone: CHapel 3-4141, Extension 315

Liaison Officer for the University: Robert C. Burns, Director of Institutes and Special Programs, College of General Studies

Telephone: FEderal 8-0250, Extension 441

Type of Course Offered: Graduate program leading to the degree of Master of Arts in International Affairs

Length of Courses: Fifteen weeks

Open to faculty and military and civilian members of the student detachment of the Army War College

Fort Belvoir, Virginia

Educational Adviser: Emmerick Eber

Building: E-33

Telephone: EDgewater 9-5500, Extension 27154

Coordinator for the University: John G. Boswell

Telephone: FEderal 8-0250, Extension 441

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts, Bachelor of Arts, and Bachelor of Science in Cartography

Length of Courses: Eight and fifteen weeks

Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort Belvoir

Fort Detrick, Frederick, Maryland

Training Officer: Miss Veronica Catlett

Building: Civilian Personnel Office

Telephone: MOnument 3-4111, Extension 5147

Type of Course Offered: Business Management and Biochemistry courses

Length of Courses: Fifteen weeks

Open to civilian employees of Headquarters, Fort Detrick

Fort Eustis, Virginia

Educational Adviser: John Williams

Building: Educational Development Services, Building S-711

Telephone: TRinity 7-1311, Extension 22586 or 21121

Coordinator for the University: John G. Boswell

Telephone: FEderal 8-0250, Extension 441

Type of Course Offered: Graduate program leading to the degree of Master of Arts in the field of Personnel Management

Length of Courses: Eight and fifteen weeks

Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort Eustis

Fort McNair, Washington 25, D. C.

(Undergraduate Program)

Educational Adviser: Miss Margaret Lockwood

Building: Post Education Center, Building 20A, Second Floor

Telephone: JACkson 7-9400, Extension 268.

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Eight and fifteen weeks

Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort McNair

Fort Monroe, Virginia

Educational Adviser: Paul Rahenkamp

Building: Education Center, Fort Monroe

Telephone: 727-3692

University Area Representative: Robert J. Dewey

Building: T-238, Langley Air Force Base

Telephone: PARk 2-7911, Extension 24120 or 21160

Coordinator for the University: John G. Boswell

Telephone: FEderal 8-0250, Extension 441

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts in the field of Personnel Management

Length of Courses: Undergraduate courses, eight weeks; graduate courses, fifteen weeks

Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort Monroe

Fort Myer, Virginia

Educational Adviser: Miss Margaret Lockwood

Building: Post Education Center, Building 604, South Area

Telephone: JACKson 7-9400, Extension 268

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Eight and fifteen weeks

Open to military and civilian employees of the Army and to other government employees, by permission of the Commanding Officer of Fort Myer

DEPARTMENT OF THE NAVY

Main Navy Building, Washington 25, D. C.

Training Officers: George D. Thomas, Head, Training Branch, DCPD; Edward Goemaat, Head, Professional and Academic Programs Section; Miss Kathleen V. Sullivan, Training Specialist

Building: Main Navy Building, Room 1111, Constitution Avenue at 18th Street NW.

Telephone: OXFord 6-6155

After-hours Training Program: Jack W. Charles, Coordinator for the University

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate courses leading to the degrees of Associate in Arts, Associate in Secretarial Administration, and Bachelor of Arts; graduate

program leading to the degree of Master of Arts in the fields of Controllershship, Governmental Administration, and Personnel Management

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Department of Defense

Bureau of Naval Personnel, Washington 25, D. C.

Training Officers: Cmdr. P. S. Smith, USN, Head, Officer Education and Training
Branch: DeWitt Fisher, Deputy Head; Paul L. Frantz, Special Programs Coordinator

Building: Arlington Annex, Room 3713

Telephone: OXford 4-2403 or 4-2776

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Special courses in Human Relations and Management, Public Speaking for Naval Personnel, and Foreign Languages

Length of Courses: Fifteen weeks

Open to military personnel on active duty in the Department of the Navy by quota assigned to the various bureaus and offices, and to civilian employees of the Department by permission

Bureau of Naval Weapons, Washington 25, D. C.

Training Officers: S. P. Dudzik, Head, Employee Training and Development Section;
Mrs. Honorah B. Peter, Training Officer

Building: Munitions Building, Room 2122, Constitution Avenue at 20th Street NW.

Telephone: OXford 6-7341

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Special courses in Human Relations and Management

Length of courses: Fifteen weeks

Open to civilian and military personnel on active duty in the Bureau of Naval Weapons by quota assigned to the various divisions and offices, and to civilian employees of the Department of the Navy by permission

Bureau of Ships, Washington 25, D. C.

Training Officer: Mrs. Edna K. Trudeau, Employee Development Officer

Building: Main Navy Building, Room 1427, Constitution Avenue at 18th Street NW.

Telephone: OXford 6-2927

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Graduate program leading to the Master of Arts degree in the fields of Controllershship, Governmental Administration, and Personnel Management

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Department of Defense

Bureau of Yards and Docks, Washington 25, D. C.

Training Officers: Robert J. Wilson, Head, Training Section; E. R. Settle, Training Officer

Building: Yards and Docks Annex, Room 2-A-72, Memorial Drive and H Road,
Arlington, Virginia

Telephone: OXford 5-4367

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Courses: Graduate program leading to the degree of Master of Arts in the
fields of Controllershship, Governmental Administration, and Personnel Management

Length of Course: Fifteen weeks

Open to military and civilian personnel and to other government employees, by
permission of the Commanding Officer

David Taylor Model Basin, Carderock, Maryland

Training Officer: William H. Struhs, Jr., Head, Training Branch

Building: 13, Room 202

Telephone: EMpire 5-2600, Extension 394

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Special in-service training courses arranged by the Train-
ing Officer

Length of Courses: Fifteen weeks

Open to military personnel and civilian employees of the David Taylor Model
Basin and to other government employees, by permission of the Commanding
Officer of the installation

Military Sea Transportation Service, Washington 25, D. C.

Training Officers: Maurice V. Foreman, Director, Training Division: John J. Bean,
Assistant Director

Building: T-8, Room 1217, 3800 Newark Street NW.

Telephone: OXford 6-9620

After-hours Training Program: Jack W. Charles, Coordinator for the University

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Graduate and Special Courses in Management

Length of Courses: Fifteen weeks

Open to civilian and military personnel of the Military Sea Transportation Service
and to other government employees, by permission of the Commanding Officer of
the installation

National Naval Medical Center, Bethesda, Maryland

Information and Education Officer: Lt. Russell P. Van Hooser, USN

Building: 144, Information and Education Office

Telephone: OLiver 42500, Extension 585

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate program leading to the degrees of Associate
in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy, employees of the National
Institutes of Health, and to other government employees, by permission of the
Commanding Officer of the National Naval Medical Center

Naval Air Station, Anacostia, Washington 25, D. C.

Information and Education Officer: Ens. D. J. Cate, USN

Building: Administration Building

Telephone: LUdlow 4-2400, Extension 321

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy and to other employees of the Department of Defense, by permission of the Commanding Officer of the Naval Air Station

Naval Air Test Center, Patuxent River, Maryland

Information and Education Officer: Lt. B. V. Hartshorn, USNR

Building 410, Information and Education Center

Telephone: VOlunteer 3-3111, Extension 524 or 595

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy and to other government employees and civilians, by permission of the Commanding Office of the Naval Air Test Center

Naval Engineering Experiment Station, Annapolis, Maryland

Training Officer: Lorick F. Fox

Building: 3-A, Administration Building, Industrial Relations Department

Telephone: COlonial 3-2611, Extension 1210

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Courses in undergraduate program leading to the degrees of Associate in Arts, Associate in Science, and Bachelor of Arts; pre-engineering courses and graduate courses

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy and to other government employees and civilians, by permission of the Commanding Officer of the Engineering Experiment Station

Naval Hydrographic Office, Suitland, Maryland

Employee Development Officer: Paul F. Murphy

Building: FOB 3, Room G-121

Telephone: REdwood 6-2700, Extension 248

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts, Bachelor of Arts, and the Bachelor of Science in Cartography

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy, employees of the Census Bureau, and to other government employees in the Department of Defense, by permission of the Naval Hydrographic Office

Naval Propellant Plant, Indian Head, Maryland

Training Officer: Lester S. Hottle, Director of Education and Community Relations
Building: D-325, Industrial Relations Office

Telephone: Riverside 3-2111, Extension 591

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate and graduate courses

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy and to other government employees and civilians, by permission of the Commanding Officer of Naval Propellant Plant

Naval Research Laboratory, Washington 25, D. C.

Training Officers: William J. McLaughlin, Joseph G. Y. Sanborn, Staff Training Section; E. C. Reinhardt, Science Education Section

Building: 43, Rooms 102 and 113, 4555 Overlook Avenue SW.

Telephone: 5741-856 or 5741-858

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate and graduate courses

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy at the Naval Research Laboratory and other government employees, by permission of the Naval Research Laboratory

Naval Supply Center, Norfolk, Virginia

Training Officers: Harold V. Pelton, Director; Bernard A. La Barge, Assistant Director of Training

Building: W-143

Telephone: MADison 2-8211, Extension 2144

Coordinator for the University: John G. Boswell

Telephone: FEderal 8-0250, Extension 441

Type of Course Offered: Graduate program leading to the degree of Master of Arts in the fields of Controllershship, Governmental Administration, and Personnel Management

Length of Course: Fifteen weeks

Open to military and civilian personnel of the Navy and to other government employees, by permission of the Commanding Officer

Naval Weapons Laboratory, Dahlgren, Virginia

Training Officer: Donald E. Voekler, Senior Training Officer

Building: Industrial Relations Building

Telephone: NOrth 32511, Extension 609

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate and graduate courses in Physics

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Department of Defense and others by permission of the Commanding Officer of the installation

Naval Weapons Plant, Washington 25, D. C.

Training Officers: Charles A. Trainum, Supervisory Training Officer; Mrs. Judy Muir, Training Officer (Acting)

Building: 172, Second Floor, M at 8th Street SE.

Telephone: LIncoln 75700, Extension 2160, 2188, or 2416

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate courses in accounting, administration, and personnel management; special certificate program for supervisors to meet local in-service training needs

Length of Courses: Fifteen weeks

Open to military and civilian personnel of the Navy and to other government employees, by permission of the Superintendent of the Naval Weapons Plant

United States Marine Corps Schools, Quantico, Virginia

Education Officer: 2d Lt. Bonnie M. Hodges, USMC

Building: Special Services Building, Education Office, Larson Gymnasium

Telephone: Quantico 1000, Extension 26749

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Eight and fifteen weeks

Open to military personnel and their dependents and civilian personnel attached to the Marine Corps Schools

DEPARTMENT OF JUSTICE, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Daniel Keenan, Departmental Training Officer

Building: Justice Department Building, Room 1226, 10th Street and Pennsylvania Avenue NW.

Telephone: REpublic 7-8200, Extension 3124

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of Justice and to personnel of other government agencies by permission

FEDERAL BUREAU OF INVESTIGATION, WASHINGTON 25, D. C.

Special Agent: William E. Clark, Personnel Office

Building: Justice Department Building, Room 4513, 9th Street and Pennsylvania Avenue NW.

Telephone: EXecutive 3-7100, Extension 402
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts
Length of Courses: Fifteen weeks
Open to employees of the Federal Bureau of Investigation only

DEPARTMENT OF LABOR, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: James C. Stevens, Employee Development Officer; Kenneth Bute, Assistant Training Officer
Building: Labor Department Building, Room 7411, 14th Street and Constitution Avenue NW.
Telephone: EXecutive 3-2120, Extensions 2101 and 2102
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts
Length of Courses: Fifteen weeks
Open to military and civilian employees of the Department of Labor and to personnel of other government agencies by permission

DEPARTMENT OF STATE, WASHINGTON 25, D. C.

Training Officer: Mel H. Bolster, Chief, Career Development Section; Departmental Placement and Career Development Branch, Office of Personnel
Building: State Department Building, 23d Street between Virginia Avenue and C Street NW.
Telephone: DUDley 3-6288
Coordinator for the University: Jack W. Charles
Telephone: FEderal 8-0250, Extension 488
Type of Course Offered: Special courses designed for employees self-development
Length of Courses: Fifteen weeks
Open to employees of the Department of State, I. C. A., and U. S. I. A.

DEPARTMENT OF THE TREASURY, WASHINGTON 25, D. C.

BUREAU OF ACCOUNTS

(Member of Federal Triangle Educational Association)

Training Officers: Miss Joyce Davenport, Training Assistant; Miss Nancy Bake, Assistant Training Assistant
Building: Treasury Annex Number 1, Room 242, Pennsylvania Avenue and Madison Place NW.
Telephone: WOrth 4-2628
Coordinator for the University: Alexander G. Rose III
Telephone: FEderal 8-0250, Extension 487
Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

BUREAU OF CUSTOMS, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: James J. Doherty, James A. Everett, Employee Development Officers

Building: Internal Revenue Building, Room 7561, 12th Street and Constitution Avenue NW.

Telephone: WOrth 4-4060

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

BUREAU OF ENGRAVING AND PRINTING, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Mrs. Frances N. Nadeau, Employee Development Officer

Building: Industrial Relations Office, 14th and C Streets NW.

Telephone: WOrth 4-7571

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

BUREAU OF NARCOTICS, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Walter Panich, Narcotic Agent

Building: Coast Guard Building, Room 8107, 1300 E Street NW.

Telephone: WOrth 4-2243

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

COAST GUARD, WASHINGTON 25, D. C.

Training Officers: Jasper L. Kranke, Supervisory Training Officer; C. Howard Larson, Training Assistant

Building: U. S. Coast Guard Building, Room 4211, 1300 E Street NW.

Telephone: WOrth 4-5350

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Coast Guard and to personnel of other government agencies by permission

INTERNAL REVENUE SERVICE, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: D. C. Barry, Chief, National Office Training Branch; Miss Ethel W. Morgan, Miss Ruby Bennett, Employee Development Training Officers

Building: Internal Revenue Service Building, Room 5605, 12th Street and Constitution Avenue NW.

Telephone: WOrth 4-3931 (Mr. Barry and Miss Bennett), WOrth 4-3377 (Miss Morgan)

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Department of the Treasury and to personnel of other government agencies by permission

DISTRICT OF COLUMBIA GOVERNMENT, WASHINGTON, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: Benjamin Ludwig, Training Officer; John O'Hagan, Employee Development Assistant

Building: District of Columbia Government Building, Room 209, 499 Pennsylvania Avenue NW.

Telephone: NAtional 8-6000, Extension 2270

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the District of Columbia Government and to personnel of other federal government agencies by permission

DEPARTMENT OF PUBLIC WELFARE

Children's Center, Laurel, Maryland

Training Officer: Mr. Reginald Orem, Employee Development Officer
 Building: Administration Building
 Telephone: NAtional 8-1496

Coordinator for the University: Alexander G. Rose III
 Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Special courses in Psychology

Length of courses: Fifteen weeks

Open to personnel of the Children's Center and to personnel of other District and federal government agencies by permission

District of Columbia General Hospital

Training Assistant: Miss Elizabeth M. McQuaide

Building: Administration Annex, District of Columbia General Hospital, 19th and E Streets SE.

Telephone: LIncoln 7-9200, Extension 569

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate courses in Psychology

Length of Course: Fifteen weeks

Open to all employees of District of Columbia General Hospital

FEDERAL AVIATION AGENCY, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: E. A. Woody, Chief, Management and Training Branch; Thomas F. Royalls, Chief, Management and Training Section
 Building: T-3, Room 1120, (Mr. Woody); Room 1118 (Mr. Royalls), 16th Street and Constitution Avenue NW.

Telephone: WOrth 7-2027 (Mr. Woody); WOrth 7-2340 (Mr. Royalls)

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Federal Aviation Agency and to personnel of other government agencies by permission

FEDERAL COMMUNICATIONS COMMISSION, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officer: Mrs. Pauline M. Foster, Assistant Personnel Officer

Building: New Post Office Building, Room 1207, 12th Street and Pennsylvania Avenue NW.

Telephone: EXecutive 3-3620, Extension 134

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Federal Communications Commission and to personnel of other government agencies by permission

FEDERAL RESERVE BOARD, WASHINGTON 25, D. C.

Training Officer: June A. Stetter, Administrative Assistant, Division of Personnel Administration

Building: Federal Reserve Building, 20th Street and Constitution Avenue NW.

Telephone: REpublic 7-1100, Extension 435

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to all government employees and others by permission

INDUSTRIAL COLLEGE OF THE ARMED FORCES

FORT McNAIR, WASHINGTON 25, D. C.

Project Officer: Col. Thomas W. Sills, USA

Building: Industrial College of the Armed Forces, Room 220

Telephone: EXecutive 3-7700, Extension 458

Coordinator for the University: Robert C. Burns

Telephone: FEderal 8-0250, Extension 441

Type of Course Offered: Graduate program leading to the degree of Master of Business Administration

Length of Courses: Fifteen weeks

Open to faculty, military, and civilian members of the student detachment of the Industrial College of the Armed Forces

INTERSTATE COMMERCE COMMISSION, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: William Bateman, Training Officer; Dyrk Van Duxl, Assistant Training Officer

Building: Interstate Commerce Building, Room 1148, 12th Street and Constitution Avenue NW.

Telephone: NAtional 8-7460, Extension 3107

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Interstate Commerce Commission and to personnel of other government agencies by permission

NATIONAL SCIENCE FOUNDATION, WASHINGTON 25, D. C.

Training Officer: James R. Keene

Building: National Science Foundation Building, 19th Street and Constitution Avenue NW.

Telephone: STerling 3-2140, Extension 389

Coordinator for the University: Jack W. Charles

Telephone: FEderal 8-0250, Extension 488

Type of Course Offered: Courses leading to the degrees of Associate in Arts and Bachelor of Arts

Length of Courses: Fifteen weeks

Open to all government employees by permission of the National Science Foundation

NATIONAL WAR COLLEGE

FORT McNAIR, WASHINGTON 25, D. C.

Project Officer: Lt. Col. H. F. Fuller, USAF

Building: National War College, Room 116

Telephone: EXecutive 3-7700, Extension 343

Coordinator for the University: Robert C. Burns

Telephone: FEderal 8-0250, Extension 441

Type of Course Offered: Graduate program leading to the degree of Master of Arts in International Affairs

Length of Courses: Fifteen weeks

Open to faculty and the military and civilian members of the student detachment of the National War College

POST OFFICE DEPARTMENT, WASHINGTON 25, D. C.

(Member of Federal Triangle Educational Association)

Training Officers: James E. Herby, J. Robert Ernst, Employee Development Officers
Building: New Post Office Building, Room 3140, 12th Street and Pennsylvania Avenue NW.

Telephone: WOrth 1-7293

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to military and civilian employees of the Post Office Department and to personnel of other government agencies by permission

VETERANS ADMINISTRATION, WASHINGTON 25, D. C.

Employee Development Officer: Harry T. Bredenberg, Employee Relations and Training Division

Building: Veterans Administration, Main Building, Room 115, Vermont Avenue and H Street NW.

Telephone: DUDley 9-3102

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate program leading to the degrees of Associate in Arts and Bachelor of Arts; graduate program leading to the degree of Master of Arts

Length of Courses: Fifteen weeks

Open to employees of the Veterans Administration and to personnel of other government agencies by permission

MELPAR, INCORPORATED

FALLS CHURCH, VIRGINIA

Employment Manager: Francis J. Drummond

Building: Central Office Building, Personnel Office, 3000 Arlington Boulevard, Falls Church, Virginia

Telephone: JEFFerson 4-6000, Extension 2220

Coordinator for the University: Alexander G. Rose III

Telephone: FEderal 8-0250, Extension 487

Type of Course Offered: Undergraduate and graduate courses in mathematics

Length of Courses: Fifteen weeks

Open to Melpar employees only

EDUCATION COURSES FOR TEACHERS

Undergraduate and graduate courses for elementary and secondary school teachers have been given by the College of General Studies in coordination with the School of Education in the school systems in the areas listed below. Teachers interested in having a program in Education started in their communities should make their requests known through their Directors of Instruction to Donald Thomas McNelis (FEderal 8-0250, Extension 441), Coordinator for The George Washington University of Off-Campus courses in Education.

ALEXANDRIA PUBLIC SCHOOLS

T. C. Williams, Superintendent
418 South Washington Street
Alexandria, Virginia

Telephone: KING 9-9100

ARLINGTON COUNTY PUBLIC SCHOOLS

Joseph B. Johnson, Assistant Superintendent for Instruction
1426 N. Quincy Street
Arlington, Virginia

Telephone: JACKson 2-7700

BERKELEY COUNTY PUBLIC SCHOOLS

Jack K. Randolph, Superintendent of Schools
David E. Mudge, Assistant Superintendent
Berkeley County Public Schools
Martinsburg, West Virginia

Telephone: Martinsburg 8978

CALVERT COUNTY PUBLIC SCHOOLS

Maurice A. Dunkle, Superintendent of Schools
Prince Frederick, Maryland

Telephone: Prince Frederick 76 and 86

FAIRFAX COUNTY PUBLIC SCHOOLS

W. Harold Ford, Assistant Superintendent for Instruction
Fairfax County School Board
Fairfax, Virginia

Telephone: CRescent 3-6500

FREDERICK COUNTY PUBLIC SCHOOLS

Quentin L. Earhart, Assistant Superintendent for Instruction
115 East Church Street
Frederick, Maryland

Telephone: MOnument 2-4191

CLARKE COUNTY PUBLIC SCHOOLS

George W. Burton, Superintendent
Clarke County Public Schools
Berryville, Virginia

Telephone: Berryville 33

JEFFERSON COUNTY PUBLIC SCHOOLS

T. A. Lowery, Superintendent
Miss Lucille Heflebower, Supervisor of Instruction
Jefferson County Public Schools
Charles Town, West Virginia

Telephone: Charles Town 64

LOUDOUN COUNTY PUBLIC SCHOOLS

Caleb J. Gibson, Director of Instruction
Mrs. Ruth D. Schulke, Supervisor, Elementary Education
Loudoun County School Board
Leesburg, Virginia

Telephone: SPring 7-2571

MONTGOMERY COUNTY PUBLIC SCHOOLS

Mrs. Helen M. Johnson, Supervisor of In-Service Education
Montgomery County School Board, Box 231
Rockville, Maryland

Telephone: POplar 2-5000

PRINCE GEORGES COUNTY PUBLIC SCHOOLS

Edward S. Beach, Jr., Administrative Assistant to the Superintendent
Prince Georges County School Board
Upper Marlboro, Maryland

Telephone: MArket 7-2811

PRINCE WILLIAM COUNTY PUBLIC SCHOOLS

Claude E. DeHaven, Assistant Superintendent for Instruction
Prince William County School Board
Manassas, Virginia

Telephone: EMpire 8-2104

ST. MARY'S COUNTY PUBLIC SCHOOLS

Robert S. King, Jr., Superintendent of Schools
Richard L. Holler, Supervisor of Instruction
St. Mary's County School Board
Washington Street
Leonardtown, Maryland

Telephone: GReenwood 5-9141

WORCESTER COUNTY PUBLIC SCHOOLS

Paul S. Hyde, Assistant Superintendent for Instruction
Worcester County School Board
Market Street
Snow Hill, Maryland

Telephone: Snow Hill 582 and 583

CAMPUS DIVISION

DEGREE PROGRAM

The Campus Division is designed for promising adults with unusual backgrounds who merit the individual consideration of this Division's experimental approach to admission, advanced standing, curricula, and evaluation of achievement. The criteria for eligibility for admission are stringent in order to limit matriculation to (1) adults well qualified to undertake college work but lacking certain academic requirements for admission to other degree-granting schools and colleges of the University and (2) adults who through work experience, have gained broad knowledge and high competency in some area of learning. This knowledge may be validated by special examination to entitle them to advanced standing toward a degree.

REQUIREMENTS FOR ADMISSION

The applicant must meet the following requirements:

1. He must be an adult who has already achieved outstanding success in his vocation.
2. He must have completed 12 semester hours of work at The George Washington University while enrolled in courses in the Off-Campus Division, the Division of University Students, or the Division of Special Students, with a grade of at least C+ (quality-point index of 2.50). The student who has completed a substantial amount of college work elsewhere with excellent grades may apply for admission to degree candidacy after 6 semester hours at The George Washington University.
3. He must present valid reasons for selecting degree candidacy in the Campus Division of the College of General Studies rather than in another school or college of the University.
4. He must enroll for at least two courses a semester on Campus. Full-time study is encouraged.

The Campus Division offers programs leading to the degrees of Associate in Arts and Bachelor of Arts, as described under the Off-Campus Division, pages 30-31 and 34-37.

In cooperation with Columbian College of Arts and Sciences; the School of Education; and the School of Government, Business, and International Affairs, the Campus Division makes available programs leading to the degree of Bachelor of Arts with majors in the liberal arts and sciences, education, and government. Requirements for these programs are stated in the general University catalogue under the department of instruction concerned. Students selecting these majors must satisfy the prerequisite course requirements prior to admission to candidacy or as additional work after being admitted.

The program of each student admitted to this Division is carefully planned in consultation with a faculty adviser, who takes into account the student's maturity, background, work experience, and needs.

ARMED FORCES SECTION

The Armed Forces Section of the Campus Division was established for those service personnel who wish to study full-time at the University and who have only a limited time under military orders in which to complete their programs of study. Such students register for campus courses through the College of General Studies and remain under its administrative and academic control. By permission of the Dean they may enroll in appropriate courses in the Off-Campus Division.

Military and Naval personnel are eligible for admission to this section of the Campus Division if they meet the following requirements:

1. The applicant must be in attendance under official orders which give him a specified time in which to finish his degree requirements.
2. He must prove that the degree requirements can be completed in the time specified in his orders only by taking advantage of the advanced standing provisions of this College.
3. He must be in a position to enroll for full-time study.

By special arrangements with the Department of the Navy, a special naval section of the Armed Forces Section has been established. All naval personnel attending the University as full-time students, ordinarily for five semesters. Campus coordinator and academic adviser: Dr. John Francis Latimer, Building E, Room 300; FEederal 8-0250, Extension 494.

The Air Force Advanced Management Program, sponsored by the United States Air Force Institute of Technology, provides 50 semester hours of work in advanced management and supporting fields through the educational facilities of the School of Government, Business, and International Affairs for a selected group of Air Force officers. Those officers who qualify, by a combination of academic background and the satisfactory completion of this program can be awarded a Bachelor's degree by the College of General Studies. Officers who already hold a Bachelor's degree may take these courses for graduate credit toward a Master of Arts degree. Campus coordinator and academic adviser: Dr. Waldo Sommers, Hall of Government, Room 205 (710 Twenty-first Street NW.), FEederal 8-0250, Extension 404 or 588.

For administrative counseling, consult Robert Whittington Eller, Assistant Dean of the College of General Studies and Director, Campus Division, 706 Twentieth Street NW.; Telephone: FEederal 8-0250, Extension 441 or 487.

REGULATIONS

Students in the Campus Division of the College of General Studies are subject to and are expected to familiarize themselves with the regulations of the University stated in the general catalogue, as modified in this Bulletin. Copies of the general catalogue are available at the Office of the Director of Admissions.

PROFESSIONAL IN-SERVICE TRAINING

Special programs are offered to meet the in-service needs of special groups and others will be developed as the need arises.

DIVISION OF COMMUNITY SERVICES

This Division consists of The George Washington University Reading Clinic and a program of popular credit and noncredit courses, institutes, and lectures offered both on campus and off campus.

The Division was organized to provide needed auxiliary educational services and to promote programs designed to supplement the formal educational offerings of the University.

Noncredit courses in a wide variety of subject fields may be set up at the request of any interested group. There are no entrance requirements. The length of each course is determined by the wishes of the sponsoring group and the nature of the subject to be studied.

Civic clubs, church groups, trade associations, parent-teacher associations, and other organizations which are interested in promoting and organizing informal programs of study, setting up conferences, securing assistance in organizing and in developing their own leadership training courses or institutes, or receiving specialized advice or assistance are invited to consult Mrs. Lillian Fox Quigley, Assistant Director of the Division of Community Services of the College of General Studies. Call FEderal 8-0250, Extension 441.

Among the courses offered by the Division of Community Services, are the following. Unless otherwise specified, all courses are noncredit.

ADMINISTRATIVE DEVELOPMENT

The techniques of management and instruction. Part of the Administrative Development Program of the Office of the Adjutant General, Department of the Army.

AMERICAN SPEECH AND DICTION

Designed for employees of foreign embassies. Articulation drills, stress and intonation patterns in "standard" American English, discussion of dialect differences, and vocabulary-building exercises. Individually designed exercises and daily tape recordings.

BUSINESS MANAGEMENT INSTITUTE

An institute on modern management principles and techniques for small business executives. Offered in cooperation with the Small Business Administration to improve skill and ability in solving practical business problems.

CHARTERED LIFE UNDERWRITERS PROGRAM

In cooperation with the Chartered Life Underwriters Institute, the College of General Studies has initiated a program of credit courses designed to assist insurance men in preparing for Chartered Life Underwriters' examinations.

EFFECTIVE SPEECH COMMUNICATION

Principles of effective speech communication, including practice in the organization, delivery, and evaluation of presentations commonly encountered in management situations.

ELEMENTARY ALGEBRA

Elementary algebra through quadratic equations in preparation for college algebra.

GROWTH OF POLITICAL PARTIES IN THE UNITED STATES

Chronological treatment of the growth of American political parties. Factors in our political history relevant to the current party struggle and the future course of politics; role of party conventions; importance of party platforms; influence of particular personalities; continuance of certain issues; impact of wars and other

disasters; mechanisms for achieving party victory; and, with special attention, the relationship between minor parties and splinter groups and the fundamental two-party nature of our political system. Parties considered socially, ethically, and politically.

HOSPITAL ADMINISTRATION

A credit course of lectures and discussions broadly covering the field of hospital administration designed especially for those working in hospitals at the executive and department-head level and for those employed in federal hospital programs who deal with various phases of hospital programming and operations.

Topics include the history of hospitals, the scope and organization of voluntary and federal hospital programs, the functional elements of hospitals, with emphasis on the application of modern management tools in Hospital Administration.

INSTITUTE FOR PARENTS

Emphasizes *understanding* in four areas of study: the gifted child, reading problems, modern school methods, and the early adolescent. Primarily to help parents understand their children in relation to themselves as parents, to the school, and to the community.

INTERNATIONAL COOKERY

Lectures and demonstrations on basic dishes of various countries to illustrate different methods of cooking and characteristic seasonings. Tastiness, low cost, high nutritional value, and availability of ingredients are considered in the choice of recipes.

INTERNATIONAL COOPERATION ADMINISTRATION PROGRAM

In cooperation with the International Cooperation Administration a fall and spring semester program is offered to the foreign students who are participants. Courses are offered on campus and include the following: Public Administration, Administrative Management, Governmental Budgeting, Governmental Accounting, Auditing, Tax Administration, Local Government Administration, Seminar on Public Finance and Economic Development, and English.

The College Preparatory Workshop for Foreign Students, a series of class meetings led by experienced university teachers introduces the foreign student to the system of higher education in the United States. Students are instructed and given practice in classroom procedures, examination techniques, note taking, report writing, the use of the library, and outside study.

INVESTMENT MANAGEMENT

A course in management for those with a basic knowledge of the stock market and investment principles. Topics include the selection of stocks most suitable for specific objectives.

INVESTMENTS

"How to Invest from \$50 to \$50,000" is frequently offered in answer to popular demand. Topics include insurance, wills, bank deposits, government bonds, real estate, various types of securities, the New York Stock Exchange, mutual funds, investment advisory services, and the importance of fitting the financial plan to the individual.

MANAGEMENT COMMUNICATION

Elements of the communication process; problems in communication; basic principles of effective communication, psychological and sociological aspects of communication; and problems of specific communication efforts.

MANAGEMENT FOR RESEARCH, DEVELOPMENT, AND TESTING LABORATORIES

Designed to train executives in development of overall managerial skills. Planned to give executives a general familiarity with tasks, problems, techniques, and methods of management; to relate these general principles to functioning of their specialized business activities; and to provide them with a forum for discussing common problems and interchanging views, knowledge, and experience.

MANUSCRIPT CLINIC: BOOKS FOR CHILDREN

A practical service for writers who are in need of professional literary counsel and detailed constructive criticism by an experienced author, editor, or critic. Completed work or work in progress is accepted in any one of the following categories: (1) a work of fiction, not to exceed 30,000 words; (2) two or three short stories; (3) a biography; (4) a work of nonfiction, not to exceed 20,000 words, or several articles; (5) a translation, not to exceed 10,000 words; (6) a picture-story book, including illustrations; (7) an outline for a longer work, together with several sample chapters.

Writers are instructed in the preparation of manuscripts for submission to a publisher, and advice on marketing is available. After consulting with the coordinator, the consultee meets with an appropriate consultant. Arrangements are made for three subsequent private meetings at a time and place convenient to the persons concerned.

NURSING EDUCATION

A credit course in the management of the hospital nursing unit is offered for nurses in the metropolitan Washington area. Emphasis is placed on the relation of the hospital nursing unit to the hospital and community, current concepts and standards in nursing service and their application to unit management, and the development of techniques for the implementation of concepts and policies. Other credit courses in this field are being developed.

PLANNING FOR RETIREMENT

A ten-session course used by many large business and industrial firms to help men and women plan for retirement.

PREPARATION OF SUMMARIES

Training in accurate summarizing of classified documents and information in readable form.

PROFESSIONAL WRITING (Introductory)

The essentials of writing techniques. Manuscripts submitted for consideration and criticism of the teacher and class. Analysis of magazine writing opportunities for free-lance writers.

PROFESSIONAL WRITING (Advanced)

Emphasis on improving quality and techniques to a professional, salable level. An interval of two weeks between classes gives the student a greater opportunity for manuscript preparation. Major emphasis is upon article writing.

PROGRAM PLANNING FOR ORGANIZATIONS

Designed especially for civic and club workers. Topics include: planning individual programs, public relations, the responsibility of leadership, and exploring projects and activities for a particular group.

STUDIES IN MANAGEMENT

Studies of modern concepts of the management function and the background of modern management theory, the tools of management, human factors in management, direction of programs, and formulation of policies.

WRITTEN COMMUNICATION

A review of the principles of clear and effective writing, particularly as it is a concern of governmental correspondence. Ten sessions, classroom demonstration and discussion of textbook assignments; ten sessions, testing and individual conferences.

WRITING FOR CHILDREN

A noncredit elementary workshop course is offered for beginning writers during the fall semester. An advanced workshop is offered in the spring semester.

WRITERS INSTITUTE

This six-day conference on fact and fiction for children and youth is a series of roundtable discussions on topics of broad general interest, conducted by experienced authors and editors.

ADMISSION AND REGISTRATION

A simplified system of admission and registration is used in noncredit courses. Such courses are open to any individual interested in enrolling. When a noncredit course is organized at the request of some particular agency or group, admission may be restricted to the students recommended by the sponsoring organization. Classes may be limited in size in order to maintain the standards desired.

FEES

The tuition fees for noncredit courses are determined by the length and nature of the course.

READING CLINIC

The Reading Clinic, Binney Hall, 2018 I Street NW., offers individual diagnostic and corrective services for all levels: primary, elementary, secondary, and adult. In addition, special reading improvement classes are conducted on the high school and adult levels.

A complete diagnosis includes psychological tests; vision, hearing, and dominance tests; and the various reading and spelling tests. Results are interpreted, and a written report is presented in conference with the parents or the individual.

The special reading classes for high school students and adults are offered

throughout the year at stated intervals. Emphasis is placed on improvement of vocabulary, speed, comprehension, and study skills. Machines such as the tachistoscope, rate accelerator, and controlled reader are used for increasing speed of comprehension.

FEEs

| | |
|---|---------------|
| Individual Diagnosis | \$35.00 |
| Individual Reading Instruction | 4.50 a lesson |
| Semi-individual Instruction | 3.50 a lesson |
| Small Groups with common reading difficulties | 2.75 a lesson |
| Materials fee | 4.00 |

All fees for diagnostic and corrective work are payable in advance at the Office of the Cashier. Reading Improvement Course fees are payable in full at the time of registration. For further information, consult Miss Mary E. Coleman, Director, Binney Hall, 2018 I Street NW.; FEderal 8-0250, Extension 491 or 598.

COURSES OF INSTRUCTION

On the following pages of this CATALOGUE, under the alphabetically arranged names of the departments of instruction, are listed the courses of instruction offered by the Off-Campus Division of the College of General Studies. The courses as here listed are subject to some slight change. The University reserves the right to withdraw any course announced.

Courses of instruction are scheduled by Training Directors of the various group organizations, agencies, and installations interested in conducting an Off-Campus program of college courses. These classes are generally offered in the late afternoon or evening, are identical with the daytime and evening sections of corresponding courses on campus, are taught by many of the same instructors, and carry the same amount of credit. By taking the evening and summer classes and extending the time of study beyond the customary four years, a student who is able to give only part of his time to college work may complete a regular curriculum and obtain a degree.

EXPLANATION OF COURSE NUMBERS

Courses are assigned dual numbers. The first is a serial number assigned by the College of General Studies at the time of registration. The serial number does not appear in this catalogue. The second number is a departmental course number assigned by the department concerned. The serial numbers are used to distinguish one class from another when the same course is offered simultaneously at different places. The departmental numbers indicate the academic level of each course.

The following system of numbering is used:

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be credited toward higher degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the officer of instruction, and when the completion of additional work has been certified by the officer of instruction.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the officer of instruction, to qualified seniors only.

INDICATION OF THE AMOUNT OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving 3 hours of credit each semester is marked (3-3), and a semester course giving 3 hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ACCOUNTING

Executive Officer: Ralph Dale Kennedy, Ph.D., Professor of Accounting, Building N, Room 11 (718 Twenty-first Street NW.), Federal 8-0250, Extension 243

1-2 Introductory Accounting (3-3)

First half: basic principles underlying accounting records, preparation of the work sheet and financial statements, accounting for single proprietorships and partnerships. *Second half:* accounting for corporations and introduction to cost accounting, analysis of financial statements, and valuation and amortization problems. Prerequisite to Accounting 2: Accounting 1 or permission of the instructor.

3 General Accounting (3)

Study of accounting systems and accounting for single proprietorships and corporations, with emphasis on accounting theory, terminology, and the analysis and interpretation of accounting data.

101 Cost Accounting (3)

Theory and purposes of industrial cost accounting; treatment of system of cost control and determination; analysis and interpretation of cost data. Prerequisite: Accounting 1-2.

111 Financial Statement Analysis (3)

Methods and techniques of preparing, analyzing, and interpreting financial statements for the guidance of operating executives, directors, stockholders, and creditors; influence of price level changes on accounting data; determination and interpretation of trends and ratios. Prerequisite: Accounting 1-2 or permission of the instructor.

121-22 Intermediate Accounting (3-3)

First half: valuation and amortization problems of current assets, long-term investments, tangible fixed assets, intangible assets, and deferred charges; accounting for current, noncurrent, contingent, and estimated liabilities. Prerequisite to 121: Accounting 2 or permission of the instructor. *Second half:* accounting for the organization, financing, operation, and dissolution of corporations and partnerships; basic principles of consignment and installment sales. Prerequisite to 122: Accounting 121 or permission of the instructor.

144 Federal Accounting (3)

Accounting procedures in the Federal Government, with emphasis on agency level accounts, implementation of accrued expenditure legislation, and accounting support for cost-based budgets. Accounts of the United States Treasury: current concepts of allotment, obligation, and disbursement accounting and reporting. Prerequisite: Accounting 141 or four semesters of accounting.

161 Income Tax Accounting (3)

Problems involved in the federal income taxation of individuals and corporations. Differences between tax accounting and financial accounting, social security taxes. Prerequisite: Accounting 1-2.

171 Auditing (3)

Duties and responsibilities of auditors; principles and procedures of making audits, techniques of verifying each financial statement item, preparation of audit working papers and reports. Prerequisite: Accounting 121-22.

181 Accounting Systems (3)

Theory and procedure of designing and installing accounting systems, for collecting, recording, analyzing, and presenting accounting data. Prerequisite: Accounting 101, 121-22, and 171, or permission of the instructor.

191 Advanced Accounting (3)

Consolidated statements, statement of affairs, realization and liquidation reports, and estate and trust accounting. Prerequisite: Accounting 121-22.

193 Business Budgeting (3)

Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial and industrial organizations. Prerequisite: Accounting 1-2.

211-12 Managerial Accounting (3-3)

First half: analysis of the accounting system with special reference to the use of financial and operating records and accounting reports as tools of management; study of valuation and amortization problems including the influence of price level changes on accounting data. Prerequisite: Accounting 1-2 or 3. *Second half:* a survey of internal accounting controls, commercial budgets, and cost accounting systems used by management in directing and controlling a business. Prerequisite: Accounting 212: Accounting 211 or permission of the instructor.

293 Budget Preparation and Administration (3)

Principles of and research on the formulation, adoption, and execution of a system of budgetary control to aid in the management of commercial or industrial businesses.

ART

Executive Officer: Donald Chenoweth Kline, B.Arch., M.F.A., Building X (2107 H Street NW.), Federal 8-0250, Extension 351

3 The Story of Painting in the Western World (3)

A Historical survey of western art from prehistoric to modern times. Special emphasis on the masters of the Renaissance, 17th century baroque art, 18th century art—including American artists and the 19th and 20th century modernists. (A telecourse offered Summer 1961.)

BIOLOGY

Executive Officer: Paul William Bowman, Ph.D., Professor of Biology, Building G, Room 410 (2029 G Street NW.), Federal 8-0250, Extension 219

1 Survey in Biology (3)

Systematic study of the plant and animal kingdoms, with emphasis upon the interdependence of living things and their relations with their environments. Introduction to evolution, heredity, public health, and conservation. Material fee, \$7.

BUSINESS AND PUBLIC ADMINISTRATION

Executive Officer: James Carlton Dockeray, Ph.D., Professor of Finance, Building X, Room 13 (802 Twenty-first Street NW.), Federal 8-0250, Extensions 512, 539

BUSINESS ADMINISTRATION**101 Introduction to Business (3)**

(Formerly Business Organization and Combination)

The business decision-making process; decision areas, tools, and variables; business environment.

102 Fundamentals of Management (3)

Planning, organizing, directing, coordinating, and controlling the activities of the administrative unit; evolution of management thinking.

103 Institutional Management (3)

Philosophy of hospital administration: special services, food service, maintenance, internal review.

105 Personnel Management (3)

Industrial personnel and manpower programs, organizations and policy in personnel activities.

106 Problems in Personnel Management (3)

Principles of manpower management illustrated by cases drawn from business, industry, and government. Prerequisite: Business Administration 105.

107 Labor-Management Contracts (3)

Management's role in the negotiation and administration of collective bargaining agreements, as essential to development of good labor-management relations.

- 109 **Office Management (3)**
Organization and layout of an office, use of office machines and appliances, planning and execution of work, supervision problems.
- 111-12 **Personnel Records Administration (3-3)**
First half: basic principles, techniques, and methods used in collecting, processing, evaluating, and storing personnel records of all kinds. Second half: problems and cases in special kinds of records keeping and records administration.
- 113 **Real Estate (3)**
Fundamentals of real estate practice; leasing and property management; valuation, financing, and taxation.
- 117 **The Fundamentals of Life Insurance and Annuities* (3) (Part I)**
The fundamental principles of life insurance with emphasis on the economic and social functions.
- 118 **Business Life Insurance* (3) (Part II)**
Business life insurance, accident and sickness insurance, group insurance, and pensions.
- 119 **Law, Trusts, and Taxation* (3) (Part III)**
The fundamentals of general commercial law, including law of life insurance, wills, trusts, estates, taxation, and business insurance.
- 120 **Economics and Finance* (3) (Part IV)**
A survey of finance (banking, credit, corporation finance, and investments) and a survey of economic principles.
- 121 **General Insurance (3)**
A general course in underlying principles of property, life, marine, and casualty insurance, and the function of insurance in the economic life of a business or individual.
- 131 **Business Finance (3)**
Basic principles involved in the financing of business enterprises. Prerequisite: Accounting 1-2.
- 138 **Investments (3)**
Analysis of factors of investment credit with application to different types of investments, proper selection of investments for various classes of investors, regulation. Prerequisite: Accounting 1-2.
- 141 **Principles of Marketing (3)**
An introduction to marketing structure and its relation to the total economy, consumer and demand analysis, retailing, wholesaling, major marketing management problems and policies. Prerequisite: Economics 1-2.
- 150 **Procurement and Materials Management (3)**
Purchasing organization, procedures, and policies; market relationships; selection of merchandise and sources of supply; procurement information and records; evaluation of procurement practices in industry and government.
- 152 **Retail Merchandising and Control (3)**
Managerial problems and policies with reference to profit calculations, pricing, purchase planning, stock control, merchandise and expense budgets, inventory evaluation, and other related phases of retail merchandising. Prerequisite: Business Administration 151 or Accounting 1-2.
- 161 **Commercial Law: Contracts, Sales, Agency, and Bailments (3)**
- 162 **Commercial Law: Negotiable Instruments, Property, Mortgages (3)**
- 163 **Law in Relation to the Form of Business Units:
Corporations, Partnerships, and Trusts (3)**

* These courses are a part of a program to prepare individuals for the Chartered Life Underwriters Examinations. Classes meet once a week for thirty weeks.

193 Management Communication (3)

A survey course in the problems of communication; written communication: style and format; oral communication: oral briefing and presentation; group leadership; rapid reading; completed staff work; and related subjects.

198 Case Problems in Management (3)

Principles and techniques of management illustrated by cases drawn from business and industry. Prerequisite: Business Administration 102, 105, 131, 141.

199-200 Research (3-3)**201 Advanced Management (3)**

An advanced course in management emphasizing principles of management in relation to business enterprise.

218 Survey of Data Processing (3)

A survey of modern data processing systems with emphasis on the management problems associated with the installation and use of such systems.

237 Security Analysis (3)

An advanced course in the applications of investment principles and analytical techniques to the selection of investments. Prerequisite: Business Administration 138.

251 Seminar in Retail Management (3)

Research in retailing practices, with emphasis on trends, new developments, and current problems.

261 Seminar in Advanced Management (3)

Principles of organization. Analysis of organization problems involving the relation of government bureaus and offices with military services, the Congress, the public, other government departments, and with industrial concerns. Review and analysis of business administration and management. Intensive training in conference techniques and the oral presentation of points of view.

263 Business Organization and Management (3)

Principles and techniques of administration and management. Analysis of methods of forecasting, planning, organizing, assembling personnel and resources. Historical development of management as a background for present day methods.

268 Management Engineering (3)

Analysis of the techniques for initiation and implementation of management engineering programs, with emphasis on organization and methods surveys, including study of work measurements, work simplification, management audits, and other management improvement programs.

275 Human Relations in Business (3)

Individual, group, inter-group, and other human behavior and development: application of social science research to business. Practical applications will be emphasized.

280-81-82 Managerial Aspects of National Security* (3-3-3)

The application of business management principles to the military aspects of national security; organization and administration of the Federal Government for national defense; management of national resources (natural, human, energy, economic); budgeting and controllership; determination of requirements; procurement; production; supply management; and communications.

286 Management in the Armed Forces (3)

Special problems of military organization and management; applicability of business management techniques to the armed forces.

288 Executive Leadership (3)

Examination of principles and problems of executive leadership and development; intensive consideration of basic issues and guides to executive action in business and industry.

* Available only to students in the Master of Business Administration program at the College of the Armed Forces.

public administration; review of the literature, significant research findings, and practical illustrations.

293-94 *Business Research* (3-3)

296 *Seminar in Controllershship* (3)

Research on advanced problems of the controller in all types of business organization and the Federal Government.

299-300 *Thesis* (3-3)

HOSPITAL ADMINISTRATION

221 *Survey of Medical Care Organization* (3)

A survey course for students in other fields who wish an overall knowledge of hospital, nursing home, and other organizations for medical care. (Not open to majors in Hospital Administration.)

222 *Survey of Medical Care Management Procedures* (3)

A survey course for students in other fields who wish an overall knowledge of management procedures in hospitals, nursing homes, and similar organizations. (Not open to majors in Hospital Administration.)

PUBLIC ADMINISTRATION

210 *The Management Function* (3)

Principles and processes of management with particular attention to planning of organization, direction and coordination of work, internal communication, and measurement of achievement in government.

213 *Administration in Government* (3)

Selected topics in problems of federal administration, with particular attention to the role of Congress and the public in the administrative processes.

216 *Management Analysis and Methods Improvement* (3)

Management engineering, techniques of organization survey and work analysis, improvement of administrative effectiveness, application of principles of scientific management.

231 *Public Personnel Management* (3)

Basic principles; structure and organization of personnel offices; responsibilities; inter-agency relationships; personnel staffing, training, and work measurement.

232 *Personnel Procedures and Problems* (3)

Study of such personnel functions as recruitment, selection, placement, promotion, supervision, evaluation, classification, and training. Practical problems of personnel administration.

233 *Seminar in Manpower Development and Utilization* (3)

Research projects and case studies in ways and means of increasing employee potential, use of training programs, executive development, incentive systems.

237 *Intermediate Management and Supervision* (3)

The role of the supervisor and intermediate manager, methods for improving group performance, work measurement, pertinent regulations governing federal personnel.

251 *Governmental Budgeting* (3)

The role of budgeting in management; the principles and practices of budgetary formulation and administration.

252 *Seminar in Planning and Programming* (3)

Performance budgeting; relating the work program to the fiscal program; budgetary evaluation. This course is primarily for students who have completed Public Administration 251.

260 Seminar in Policy Formulation and Administration (3)

Development and administration of agency goals and objectives, influence of individuals upon them; factors involving informal organization such as internal pressure groups, use of sanctions, and role of executive in furthering administrative policy.

299-300 Thesis (3-3)**CHEMISTRY**

Executive Officer: Charles Rudolph Naeser, Ph.D., Professor of Chemistry, Samsom Hall, Room 211 (2036 H Street NW.), FEderal 8-0250, Extension 261

3-4 Fundamentals of Physical Science (4-4)

A year course: credit is not given for the first half until the second half is completed. Introduction to methods and achievements of physical science; covering selected topics in chemistry, physics, astronomy, and geology. For nonscience majors. Laboratory fee, \$11 a semester.

11-12 General Chemistry (4-4)

A year course: credit is not given for the first half until the second half is completed. Lecture (2 hours), laboratory (4 hours), recitation (1 hour). An elementary course in general chemistry. Prerequisite: one year of high school algebra. Laboratory fee, \$18 a semester.

21 Qualitative Inorganic Analysis (4)

Lecture (2 hours), laboratory (6 hours). Theoretical and practical study of methods of separating and identifying the more common cations and anions using semi-micro techniques. Prerequisite: Chemistry 12, or a placement examination which may be waived at the discretion of the instructor. Laboratory fee, \$18.

111-12 Physical Chemistry Lectures (3-3)

A year course: credit is not given for the first half until the second half is completed. Introduction to physical chemistry. Students registering for Chemistry 111-12 must register concurrently for Chemistry 113-14 unless they already have adequate credit for physical chemistry laboratory. Prerequisite: either (1) Chemistry 22 and 152, Mathematics 30, Physics 8, or (2) Chemistry 21, Mathematics 30, Physics 14 and 55.

113-14 Physical Chemistry Laboratory (2-2)

A year course: credit is not given for the first half until the second half is completed. Laboratory to accompany Chemistry 111-12. Students registering for Chemistry 113-14 must register concurrently for Chemistry 111-12 unless they already have credit for lectures in physical chemistry. Laboratory fee, \$18 a semester.

131-32 Inorganic Chemistry (2-2)

A year course: credit is not given for the first half until the second half is completed. Application of modern chemical theories to inorganic substances and reactions; detailed study, developed from the periodic tables, of the descriptive chemistry of the more common elements. Prerequisite: Chemistry 152. Prerequisite or concurrent registration: Chemistry 111-12 and 113-14.

ECONOMICS

Executive Officer: John William Skinner, Ph.D., Associate Professor of Economics, Hall of Government, Room 311 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 235

1-2 Principles of Economics* (3-3)

Lecture (2 hours), recitation (1 hour). Survey of the major economic principles, institutions, and problems in contemporary life. Economics 1 is prerequisite to Economics 2.

121 Money and Banking (3)

Theory of money, credit, and banking; commercial banking and the Federal Reserve System; other financial institutions; international aspects of money; current financial problems.

* Economics 1-2 is prerequisite to all other courses in Economics.

- 133 *The Economy of the Soviet Union* (3)
Development and main features of the economic life of the Soviet Union.
- 141 *Industrial Relations* (3)
Development and practice of collective bargaining in American industry. Public control of industrial relations.
- 165 *Government Control of Economic Activity* (3)
Changing role of government in promoting and regulating economic activity, types and spheres of control.
- 217-18 *Survey of Economics* (3-3)
Survey of economic analysis and policy. Not open to graduate students in economics or economic policy.
- 219 *Managerial Economics* (3)
Analysis of price, production, and inventory policies of business firms.
- 241 *Labor Economics* (3)
Implications of industrialism for labor, questions of social policy, contributions of economics to solutions of labor problems.
- 244 *Collective Bargaining* (3)
The collective bargaining contract and the elements comprising it, analysis of the policies of labor and of management.
- 251 *Theories of Economic Development* (3)
Growth and change in economic activity, capital accumulation, innovations in technology and business organization.
- 267 *Economic Organization of the Communist Orbit* (3)
Development of the Soviet-type economy: organization under the Soviets: policies and problems: monetary, fiscal, production, allocative, foreign trade, economic growth.

EDUCATION

Executive Officer: Blake Smith Root, Ed.D., Professor of Education, Monroe Hall, Room 202 (2115 G Street NW.), FEderal 8-0250, Extension 424 and 508

- 109-10 *Human Development, Learning, and Teaching* (3-3)
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. For the general student as well as the prospective teacher. *First half*: nature of human growth, development, and learning, illustrated by observation of children in learning situations. *Second half*: nature of teaching based upon principles of human growth, development, and learning, illustrated by observation of school situations.
- 112 *Educational Measurement* (3)
Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Education 109-10, 121-22.
- 113 *Elementary School Art* (3)
Lecture and laboratory (3 hours), field work—as arranged. For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22. Material fee, \$4.50.
- 114 *Elementary School Music* (3)
Lecture (2 hours), field work (2 hours)—as arranged. For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22.
- 115 *Teaching of Reading in the Elementary School* (3)
Lecture (2 hours), field work (2 hours)—as arranged. A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 109-10 and 121-22 or teaching experience.

116 Elementary School Social Studies (3)

Lecture (2 hours), field work (2 hours)—as arranged. For teachers. Content: methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.

117 Elementary School Science (3)

Lecture (2 hours), field work (2 hours)—as arranged. For teachers. Content: methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.

118 Teaching Science in the Elementary School (3)

Designed to meet the needs of elementary teachers who wish to improve their science background and become more skillful in the method of teaching; content based on needs of group; nontechnical with respect to science content, practical in method; simple experiments, observations, use of printed materials, field trips, observation of teaching; a how-to-do course for teachers who have little science knowledge and feel insecure in their science teaching. Prerequisite: Education 109-10 and 121-22 or teaching experience.

120 Elementary School Arithmetic (3)

Lecture (2 hours), field work (2 hours)—as arranged. For teachers. Content: methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.

121-22 Society and the School (3-3)

Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. For the general student as well as the prospective teacher. *First half*: the historical and sociological development of education at local, national, and international levels; cooperation of the school with other community agencies. *Second half*: organization and operation of schools; principles and functions; role of the teacher.

128 Children's Literature (3)

Lecture (2 hours), field work (2 hours)—as arranged. For teachers. Exploring and evaluating the newer books for children and the children's classics, understanding the contribution of literature in child development, appreciating children's original expressions. Prerequisite: Psychology 1 and 22.

138 Teaching Social Studies* (2 to 4)

Lecture (2 hours), field work (2 hours)—as arranged. Prerequisite: twenty-four semester hours of social studies.

146 Teaching Foreign Languages* (2 to 4)

Prerequisite: eighteen semester hours of one foreign language.

161 Management of the Hospital Nursing Unit (3)

Analysis of nursing today, the hospital, structure and changing functions, basic concepts of management, personnel practices and activities, interpersonal relationships, legal aspects and safety factors, economics—inventories, and evaluation procedures of the hospital nursing unit.

205-6 The Curriculum (3-3)

For experienced teachers. *First half*: curriculum foundations and issues; comparison of curriculum patterns. *Second half*: principles and procedures in curriculum development; group consideration of student problems.

207 Curriculum Materials (3)

For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations.

208 A Workshop in Human Development (6)

A workshop for agricultural extension staff members designed to apply the principles of the behavioral sciences to their work.

* This is a special methods course. Prerequisite to all special methods courses: Education 109-10, 121-22, and 131. Additional prerequisites are stated under each course.

209 Child Growth and Development (3)

An interdisciplinary approach to child development taking into account such factors as society and culture, socialization, and socializing agents with particular emphasis on the home and school.

210 Adolescent Growth and Development (3)

A consideration of physical, intellectual, and cultural backgrounds of adolescence with particular emphasis on social development, adjustment to organized society, educational development and adjustment to school, and home relationships.

211 Evaluation in Education (3)

Concept of evaluation, relationship between evaluation of ends and means, steps involved in the evaluation of learning outcomes. As the course progresses each student develops solutions for evaluation problems related to his work situation.

212 Educational Measurement (3)

Basic measurement techniques; construction, selection, administration, and interpretation of objective and essay-type examinations; statistical analysis of test results; laboratory experiences in the use of test instruments.

213-14 History of Education (3-3)

First half: the European backgrounds of American education. *Second half:* the evolution of the American school system.

215 Education of Exceptional Children (3)

For classroom teachers. A survey of current problems in the education and guidance of exceptional pupils. Nature and needs of those physically, mentally, or emotionally handicapped; needs of the gifted. Resources for help in correction, diagnosis, therapy, education, and guidance.

216 Education of Slow-learning Children (3)

Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties.

217-18 Philosophy of Education (3-3)

First half: designed to help students formulate a personal philosophy of education. *Second half:* social foundations of education; a study of the forces that shape the policies and offerings of the school.

221 Early Childhood Education (3)

For experienced teachers. Emphasis on methods, materials, and learning experiences designed to meet the developmental needs of kindergarten and primary-grade children.

223-24 Reading Problems (3-3)

For experienced teachers. Study of reading difficulties on elementary and secondary school levels; classroom and clinical procedures in solving reading problems.

227 Basic Issues in Elementary Education (3)

A consideration of basic issues in the purposes, organization, and conduct of elementary education. Emphasis on the philosophical and psychological roots of fundamental assumptions as they relate to classroom practices.

228 Instructional Areas in Elementary Education (3)

Critical appraisal of the objectives, organization, content, and teaching methods in the language arts, arithmetic, social studies, science, arts and crafts, health and physical education.

229 Administration of Elementary Education (3)

For experienced teachers and administrators. Administration as a means of achieving instructional objectives, organizing learning and teaching activities, handling supplies and equipment, maintaining the building, and integrating school and community life. Emphasis upon guide lines to action.

231 Secondary School Classroom Procedures* (3)

Survey of current classroom practices with particular attention to selected topics such

* Prerequisite: adequate professional preparation

as teacher-pupil planning, group procedures, pupil security, initiatory and culminating activities, individual and group evaluation techniques, teaching aids, etc.; review of recent literature.

233 Audio-visual Education (3)

Lectures (2 hours), laboratory (1 hour). Role of audio-visual materials in learning; selection, evaluation, and use of materials; administrative problems in the operation, maintenance, and use of audio-visual materials and equipment. Material fee, \$7.

241 Education of the Gifted (3)

For classroom teachers. Nature and discovery of giftedness; provisions for the gifted in regular classes; experimental projects.

243 Human Relations in the Classroom (3)

Principles and practices involved in interpersonal relationships between learner and teacher and among learners.

245 School and Community (3)

The school as an important member of a team of social agencies that builds the community.

251 Guidance in Secondary Schools (3)

Scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program.

252 Organization and Administration of Guidance Services (3)

Designed for guidance directors and supervisors and experienced school counselors who hope to qualify for such positions in the near future. Prerequisite: a minimum of 15 semester hours of approved graduate work in Measurement and Guidance.

254 The Junior High School (3)

Purposes, organization, core programs, guidance, developing course of study, extra-classroom activities. Prerequisite: adequate professional preparation.

261 Improved Method of Instruction in Tailoring (3)

Recent simplified construction techniques including the Bishop Method in relation to tailoring coats and suits. Evaluation of the techniques and their application to various levels of teaching in the Metropolitan area. Illustrative material developed from the techniques. Each student will construct a garment outside of class using the simplified techniques for constructive criticism by class members.

263-64 Employee Training (3-3)

First half: nature and purpose, review of major programs—orientation, supervision, apprentice, clerical skills, communication. Second half: administrative problems and practices, training media, coordination with other management functions. Prerequisite: adequate professional preparation or two years of experience in employee training.

265-66 Teaching Secondary School English (3-3)

A refresher course for teachers of English. Discussion of new approaches to high school content. Offered in cooperation with the departments of English and Speech. First half: communication skills—structural linguistics, composition, and speech. Second half: American and English literature.

271 The Teacher and School Administration (3)

A survey course for teachers and prospective administrators. Education and world affairs, national agencies, role of the state, local administration, school finance, legal controls, school plant, public support, democratic administrative procedures, improving teaching conditions.

275 School Finance* (3)

Educational financial theory, practice, and control, including methods of financing.

276 Seminar: Public Relations in School Administration (3)

Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making.

* Prerequisite: adequate professional preparation.

278 School Law* (3)

Sources and scope of school law; legal rights and responsibilities of teachers, pupils, and taxpayers. Other legal problems of major interest to the group

281 Group Procedures in Education (3)

Theory, practice, evaluation, and application to all educational levels.

282 Use of Community Resources (3)

A course for teachers on all levels, with emphasis on learning to use community resources to strengthen their programs of learning and teaching. The Smithsonian Institution will receive special attention as one of the examples of a valuable community resource.

285 Extra-classroom Activities (3)

Nature and purposes of selected activities: homeroom, clubs, assemblies, school publications, student council, interscholastic contest; particular attention to sponsorship, participation, finance, and evaluation.

ELECTRICAL ENGINEERING

Executive Officer: Nelson Thomas Grisamore, Ph.D., Professor of Electrical Engineering, Tompkins Hall, Room 313 (725 Twentythird Street NW.), Federal 8-0250, Extension 257

11-12 Fundamentals of Electrical Engineering (3-3)

Electric and magnetic fields, d-c and a-c electrical circuits and networks, energy sources, electromechanical energy conversion, power, electronic devices, and circuits.

First half: fields and circuits. Second half: energy, power, and electronics. Prerequisite to Electrical Engineering 11: Physics 15 and Mathematics 111 or concurrent registration. Prerequisite to Electrical Engineering 12: Electrical Engineering 11.

102 Engineering Electronics (3)

Vacuum tube and solid state devices as circuit elements, equivalent circuits, voltage and power amplifiers, feedback amplifiers, oscillators, relaxation circuits. Emphasis placed on design of electronic circuits. Prerequisite: Electrical Engineering 12, Mathematics 112.

ENGLISH†

Executive Officer: Charles William Cole, Ph.D., Professor of American Literature, Monroe Hall, Room 404 (2115 G Street NW.), Federal 8-0250, Extension 422; Building T, Room 12 (2110 G Street NW.), Federal 8-0250, Extensions 360, 547

ENGLISH COMPOSITION**C English Practice (0)**

Instruction, drill, and exercises in grammar, vocabulary, spelling, and mechanics in general; instruction and exercises in composition and reading. This course is designed to prepare students for English 1. It is offered in the College of General Studies only.

1 English Composition (3)

Review of grammar, exercises in composition, readings.

IX English Composition (3)

An intensive course in English grammar and composition to which are assigned students whose placement tests show them inadequately prepared for the regular work of English 1. The course begins with detailed instruction, drill, and exercises in the basic structure of the English language and in the writing of paragraphs; it continues

* Prerequisite: adequate professional preparation.

† Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared for English 1 will be assigned to English C. In lieu of English C, Off-Campus students may, if they desire, be given permission to register for English IX on campus. English I or IX is prerequisite to all other courses in English.

with the content of English 1. English 1X meets five hours a week and carries 3 semester hours of credit. The tuition fee for Off-Campus students is \$85 (the regular fee of \$20 a semester hour, plus an additional fee of \$25).

2 English Composition (3)

Readings and practice in expository and argumentative techniques and in research procedure. Prerequisite: English 1 or 1X.

11 The Writing of Reports (3)

Theory and practice in the writing of technical reports. Prerequisite: English 1 or 1X and 2.

WORLD LITERATURE

41-42 Introduction to World Literature (3-3)

First half: a survey of Western literary heritage from Homer to Milton. *Second half:* a review of Western literature from the English metaphysical poets to Franklin D. Roosevelt.

ENGLISH LITERATURE

51-52 Introduction to English Literature (3-3)

A historical survey. Prerequisite: English 1 or 1X.

135-36 Shakespeare (3-3)

AMERICAN LITERATURE

71-72 Introduction to American Literature (3-3)

A historical survey. *First half:* from the beginnings to the Civil War. *Second half:* from the Civil War to the present. Prerequisite: English 1 or 1X.

76 The Civil War: the Record and Interpretation (3)

Sources of materials for a study of the social, political, and literary history of the Civil War. (A telecourse offered Spring 1961.)

143 The Development Narrative in Literature (3)

A study of those works in world literature dealing with the development of the child.

144 American Literature Since 1920 (3)

Poetry, drama, and the novel. Readings and discussion.

GEOGRAPHY

Executive Officer: Robert Dale Campbell, Ph.D., Professor of Geography, Building L, Room 202 (2135 G Street NW.), FEderal 8-0250, Extensions 287 and 298

51 Introduction to Geography (3)

A study of place attributes and characteristics, patterns and associations of physical and cultural earth features.

52 World Regions (3)

The analysis of world regional divisions, description and interpretation of region complexes, evaluation of regional differences as they affect the distribution and activities of man.

113 Geomorphology* (3)

Nature and evolution of earth forms, with special emphasis upon relief features of North America. Prerequisite: Geography 51.

114 Weather and Climate* (3)

Rudimentary atmospheric physics, air mass and frontal weather analysis, regional climatology. Prerequisite: Geography 51.

115-16 Physical Geography (3-3)

Introduction to the earth sciences: form of the earth, grids and time, weather and

* This course is offered off campus only.

climate, geomorphic processes and land-forms, soils, vegetation, weather forecasting, map reading.

124 *Land Capabilities* (3)

Evaluation of land capabilities based on analysis of locational, physical, economic and social land characteristics. Principles of site analysis and best use. Systems of measurement of area potential.

125 *Transportation Complexes* (3)

A study of transportation networks and systems by which people, things, and ideas are given varying degrees of place utility. An analysis of the role of transportation in urban, national, and international relationships.

126 *World Food Supply* (3)

World patterns of production and consumption of food stuffs, commercial and subsistence agriculture. World capabilities for feeding the world's population.

132 *Land Use* (3)

Principles of geographic area analysis and land planning. Prerequisite: Geography 51, 113.

146 *World Political Geography* (3)

Types and distributions of political systems, the major political units and associations of the world, factors which affect relative political power, areas of conflict and arbitration.

176 *Photo Geography* (3)

Use of air photographs in identifying topographic features; agricultural, residential, and industrial landscapes. Prerequisite: Cartography 2; Geography 132.

195 *Eastern and Southeastern Asia** (3)

196 *The Soviet Union** (3)

261 *Physical Weather Prediction* (3)

Review of the basic equations and principles, filter approximations, scale considerations; the importance of modeling approximations; prediction of zonal momentum; a comparison between models using balanced equations and primitive equations. Discussion of the energetics of the atmosphere and its importance for short range prediction; moistadiabatic processes; consideration of truncation errors and numerical stability to finite difference schemes.

CARTOGRAPHY

1 *Map Interpretation* (3)

Characteristics and uses of different kinds of maps and charts: geographic and grid coordinates, attributes of projections, symbolization.

11 *Cartographic Drafting and Descriptive Geometry* (3)

Special visualization, engineering drawing, schematic diagrams, and descriptive geometry; use of drafting and scribing instruments and materials; exercises in cartographic design and symbolization in the drafting of topographic and special-purpose maps.

12 *Topographic Surveying* (3)

Principles, methods, and instruments used in making space measurements, including layout, elements of simple curves, coordinate system, and treatment of observational errors. Prerequisite: Mathematics 12; Cartography 11. Surveying fee, \$13.

13 *Higher Surveying* (3)

Elements of geodesy, triangulation, topography, hydrography, and precise trigonometric leveling. Prerequisite: Cartography 12. Surveying fee, \$13.

17-18 *Elementary Photogrammetry* (3-3)

Principles, methods, and instruments used in photographic surveying and production of maps, photographic interpretation, principles of stereoscopy. Prerequisite: Cartography 13.

* Regional survey.

110 Map Projections (2)

Characteristics, mathematical development, and practical construction of major map projections and grid systems. Prerequisite: Mathematics 29; Cartography 13.

111 Map Reproduction (1)

Theory of photographic process, photographic optics, emulsions, developers, lenses, offset lithographic process, line and half-tone reproduction, single and multi-color photographic reproduction. Prerequisite: Chemistry 11-12.

155 Elementary Geodesy (3)

Development of principles and formulas basic to theoretical and applied geodesy, with application to representative problems. Prerequisite: Mathematics 31.

156 Geodetic Astronomy (3)

Development and application of principles and formulas for the astronomic determination of latitude, longitude, and azimuth. Prerequisite: Cartography 155.

160 Theory of Errors and Geodetic Adjustments (3)

Separation of random and systematic errors, distribution of errors, Gaussian and Poisson distribution, fundamentals of matrix algebra with special emphasis on least squares adjustment of geodetic networks. Prerequisite: Cartography 155.

191-92 Map and Chart Construction (3-3)

Theory and practice in the various phases of map and chart construction; practice in the preparation of original maps and charts for reproduction. Prerequisite: Cartography 156.

OCEANOGRAPHY

101-2 Introductory Oceanography (3-3)

An introduction to oceanography: general characteristics of ocean basins, properties of sea water, thermal structure, waves, currents, submarine geology, tides, plant and fish ecology, new developments in oceanography based on a review of the current literature. Prerequisites: Chemistry 11-12; and Physics 11, 14, 15.

GEOLOGY

Executive Officer: Geza Teleki, Ph.D., Professor of Geology, Building C, Room 5 (2029 G Street NW.), FEderal 8-0250, Extension 517

3 Introductory Geology (3)

A survey course covering the principles of geology. (A nonlaboratory course for Off-Campus students only.)

4 Introductory Geology (3)

Geological periods, evolution of life on earth. (A nonlaboratory course for Off-Campus students only.)

105-6 Fundamentals of Geophysics (3-3)

Survey of the theories and methods of investigation used in determining the constitution and dynamics of the earth, its oceans, and atmosphere. (It is recommended that students take Geology 3, 4: *Introductory Geology*, or the equivalent.) Prerequisite: Geography 113.

GERMANIC LANGUAGES AND LITERATURES

Executive Officer: Wolfram Karl Legner, Ph.D., Professor of German, Monroe Hall, Room 405 (2115 G Street NW.), FEderal 8-0250, Extension 282.

1-2 First-year German (3-3)

A year course: credit is not given for the first half until the second half is completed. The essentials of German grammar; translation of easy prose.

3-4 Second-year German (3-3)

A year course: credit is not given for the first half until the second half is completed. Selections from modern German prose; continuation and review of grammar. Prerequisite: German 1-2 or two years of high school German.

- 9-10 *German Conversation and Composition* (3-3)
Aural training and oral practice.

HISTORY

Executive Officer: Roderic Hollett Davison, Ph.D., Professor of European History, Hall of Government, Room 404 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 232

- 39-40 *The Development of European Civilization* (3-3)
Primarily for freshmen. *First half*: the political, social, economic, and cultural history of the Old World from ancient times to 1715. *Second half*: from 1715 to the present.

- 71-72 *The Development of the Civilization of the United States* (3-3)
Primarily for sophomores. *First half*: the political, social, economic, and cultural forces of the United States in their world setting from 1492 to 1865. *Second half*: from 1865 to the present.

- 145-46 *History of Modern Russia* (3-3)
The rise and fall of the revolutionary cycle. *First half*: Tsarist Russia in the Golden Age, 1800-1917. *Second half*: Soviet Russia and the politics of empire, since 1917.

- 169 *Latin American History: Institutions and Problems* (3)
Conquest and settlement; colonial institutions; achievement of independence; and the national period, and major problems.

- 181-82 *Diplomatic History of the United States* (3-3)
Tendencies toward isolation, expansion, and collectivism; disputes with foreign countries and their settlement; and the activities of the American secretaries of state and diplomatic agents. *First half*: to 1898. *Second half*: since 1898.

- 183 *Oversea Expansion of the United States* (3)
The political, economic, social, and cultural life of our outlying possessions.

- 246 *Seminar in Eurasian History* (3)

HOME ECONOMICS

Executive Officer: Kathryn Towne, A.M., Professor of Home Economics, Building B, Room 23 (2024 G Street NW.), FEderal 8-0250, Extension 363

- 173 *Home Furnishings* (3)
A course for teachers in house furnishings as part of the environment of modern home life; the role of beautiful homes in the development of ideals and value scales; the choice of materials in the light of family means.

JOURNALISM

Executive Officer: Ross Pelton Schlabaeh, Jr., M.S., Professor of Journalism, Monroe Hall, Room 426 (2115 G Street NW.), FEderal 8-0250, Extension 379

- 141 *General Editing for Publication* (3)
Editing procedures and techniques, proof reading, titles, arrangement, layout, type uses. Intended for students preparing for trade publications and public relations work rather than newspaper work.

- 145 *Principles and Problems of Public Relations* (3)
Principles, problems, and ethics of public relations for government agencies, commercial establishments, educational and other public institutions. Case histories of successful programs.

MATHEMATICS

Executive Officer: Nels David Nelson, Ph.D., Professor of Mathematics, Monroe Hall, Room 422 (2115 G Street NW.), FEderal 8-0250, Extension 388

3 College Algebra (3)

Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry.

6 Plane Trigonometry (3)

Prerequisite: two years of high school algebra and one year of high school geometry, or Mathematics 3 (or concurrent registration therefor).

12 Analytic Geometry (3)

Prerequisite: Mathematics 3 and 6, or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry.

29 Calculus I (3)

Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite or concurrent registration: Mathematics 12.

30 Calculus II (3)

Differentiation and integration of transcendental functions with applications, methods of integration, vectors and parametric equations. Prerequisite: Mathematics 12 and 29.

31 Calculus III* (3)

Infinite series, partial differentiation, multiple integrals, solid geometry, improper integrals, and differential equations. Prerequisite: Mathematics 30 (or concurrent registration therefor), or former 20.

110 Mathematics for Meteorologists (3)**111 Mathematics for Engineers and Physicists I (3)**

Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 30 and 31.

112 Mathematics for Engineers and Physicists II (3)

Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 111 or 132.

123 Theory of Equations (3)**125 Advanced Algebra (3)****130 Introduction to Finite Differences (3)**

Finite integration and applications, interpolation (approximate integration), difference equations including Seliwanoff's treatment of the homogenous equation.

132 Differential Equations (3)**133 Introduction to Numerical Analysis (3)**

Digital computers, accuracy, interpolation, quadrature, numerical solution of equations including differential equations. Prerequisite: Mathematics 132 or 111.

139 Advanced Calculus I (3)

Limits, continuity, real number system, mean value theorems, partial differentiation, implicit function theorems, transformations, and mappings.

171 Vector Analysis (3)**172 Tensor Analysis (3)**

Review of vectors and matrices, transformation groups, curvilinear coordinates, covariant and contravariant tensors, derivatives and integrability conditions. Prerequisite: Mathematics 171.

* Mathematics 31 (or 20) is prerequisite to all second-group courses.

MECHANICAL ENGINEERING

For information consult Martin Alexander Mason, B.S. in Eng., Ing.-Dr., Professor of Civil Engineering, Tompkins Hall, Room 103 (725 Twenty-third Street NW.), Federal 8-0250, Extension 246

10 Graphical Communication (2)

Spatial visualization, engineering drawing, schematic diagrams, descriptive geometry. A laboratory course.

PHILOSOPHY

Executive Officer: Charles Edward Gauss, Ph.D., Elton Professor of Philosophy, Building N, Room 30 (718 Twenty-first Street NW.), Federal 8-0250, Extension 538

51-52 Introduction to Philosophy (3-3)

A critical introduction to the problems of modern philosophy in relation to scientific and social developments since the Renaissance. This course is not merely intended as an introduction to those courses in philosophy which follow but is a unit complete in itself for those students in other departments interested in the problems of philosophy relevant to modern thought.

121-22 Logic and Scientific Method (3-3)

First half: the elementary principles of valid reasoning with emphasis on developing skill in using these principles, introductory consideration of symbolic logic, the nature of a formal system. Second half: general analysis of the methods of investigation and reasoning used in the natural and social sciences, procedures and requirements of definition, classification and sorting, analogical and inductive inference, causal determination, the nature and function of hypothesis, measurement, principles of the theory of probability.

PHYSICAL EDUCATION FOR WOMEN

Executive Officer: Loretta May Stallings, A.M., Associate Professor of Physical Education for Women, Building H, Room 21 (714-16 Twentieth Street NW.), Federal 8-0250, Extension 341

101 Physical Education in the Elementary School (3)

Physical growth and development of the child and adolescent. Survey of age characteristics and organizations of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, and self-testing activities.

PHYSICS

Acting Executive Officer: George Martin Koehl, A.M., Professor of Physics, Monroe Hall, Room 203 (2115 G Street NW.), Federal 8-0250, Extension 200

11 Introductory Physics (3)

An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. Prerequisite: high school algebra and plane geometry. Material fee, \$11.

12 Introductory Physics (3)

Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Mechanics, wave-motion, and sound. Prerequisite: Physics 11 (or former Physics 5). Material fee, \$11.

13 Introductory Physics (3)

Lecture (1 hour), recitation (1 hour), laboratory (2½ hours). Elementary electricity and magnetism. Prerequisite: Physics 11 (or former Physics 5). Material fee, \$11.

14 General Physics (3)

Mechanics, wave-motion, and sound. Prerequisite: Physics 11. Prerequisite or concurrent registration: Mathematics 29. Material fee, \$11.

15 General Physics (3)

Electricity and magnetism. Prerequisite: Physics 14. Prerequisite or concurrent registration: Mathematics 30. Material fee, \$11.

16 General Physics (3)

Modern physics, molecular structure of matter, structure of the atom. Prerequisite: Physics 13 or 15, Mathematics 30, and consent of the instructor.

32 Electronics (2)

The phenomena of electron emission from solids, the physical properties of electron tubes, and the principles underlying their basic applications.

55 Physical Measurements (3)

Lecture (2 hours), laboratory (3 hours). Theory and methods of precise measurements in the several fields of physics. Prerequisite: Physics 11 and 12, Mathematics 29. Material fee, \$11.

102 Heat and Thermodynamics (3)

Fundamental concepts, heat transfer, the laws of thermodynamics with applications to physical systems. Prerequisite: Physics 16 or former 8, Mathematics 31 or former 20.

106 Optics (3)

Geometrical optics; elementary theory of wave motions; interference, diffraction, polarization, and dispersion of light; laws of black-body radiation. Prerequisite: Physics 16 or former 8, Mathematics 31 or former 20.

113 Atomic Physics (3)

Properties of elementary particles, interactions with radiation, atomic structure, optical and X-ray spectra, introduction to wave mechanics. Prerequisite: Physics 16 or former 8, 101 or 105, or the equivalent, Mathematics 31 or former 20.

128 Sound (3)

Production, propagation, and detection of sound waves; vibrations of sounding bodies; acoustic instruments and acoustic measurements. Prerequisite: Physics 16 or former 8, Mathematics 31 or former 20.

132 Electronics (3)

Lecture (2 hours), laboratory (3 hours). The phenomena of electron emission from solids, the physical properties of electron tubes, and the principles underlying their basic applications. Prerequisite: Physics 16 or former 8 and 55, and a course in d-c and a-c circuits in Physics or Engineering. Material fee, \$11.

138 Transistor Principles and Circuits (3)

Qualitative description of transistor action, introduction to transistor circuit analysis, low frequency circuits, power amplifiers, high frequency equivalent circuits, video and intermediate frequency amplified design, linear and nonlinear oscillators. Prerequisite: Physics 132 or the equivalent.

201 Classical Physical Theory (3)

Classical nonrelativistic and relativistic field theories. Prerequisite: Physics 101 and 105; Mathematics 132, 171. (Mathematics 171 may be taken concurrently.)

202 Classical Physical Theory (3)

Dynamics of systems of particles and of rigid bodies, generalized coordinates. Prerequisite: Physics 101; Mathematics 112 or 132, 171.

POLITICAL SCIENCE

Executive Officer: John Withrow Brewer, Ph.D., Professor of International Law, Hall of Government, Room 204 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 241

1 Introduction to Government (3)

Basic principles and problems of political life; theories, forms, and processes of government in the United States and foreign countries. Attention is also given to international relations.

- 9-10 *Government of the United States (3-3)*
First half: structure, powers, and operation of the Federal Government: Congress, the President, and the Supreme Court; elections, political parties, and pressure groups. *Second half:* state and local governments; civil rights; major functions of government at federal, state, and local levels.
- 107 *Problems in Modern Political Thought (3)*
Development of democratic political institutions and analysis of the main challenges to constitutional democracy in the 19th and 20th centuries.
- 111 *Introduction to Comparative Government (3)*
Government and politics of the principal constitutional democracies of Western Europe: Great Britain and France.
- 112 *Introduction to Comparative Government (3)*
Government and politics of the principal political systems of Central and Eastern Europe: Germany and the Soviet Union.
- 113 *Political Problems of the British Commonwealth of Nations (3)*
From Colonial Empire to modern Commonwealth: questions of equal partnership; governments and policies in the principal Commonwealth states; problems of new states.
- 114-15 *Central-Eastern Europe (3-3)*
A general survey dealing with the area of present-day Germany, the successor states of the Austro-Hungarian monarchy, Poland, and the Balkan States of Rumania, Bulgaria, and Yugoslavia (and the Soviet fringe of Latvia, Lithuania, Estonia, and Finland).
- 121-22 *The Constitution of the United States (3-3)*
Judicial power of federal courts in constitutional interpretation. *First half:* emphasis on separation of powers, federal-state relationships, and taxation. *Second half:* emphasis on constitutional protection of civil rights.
- 145 *Political Parties and Politics (3)*
Organization and operations of political parties in the United States: major and minor parties, bosses and corruption, nominations and elections, influence on President and Congress.
- 146 *Political Pressures and Public Reactions (3)*
Public opinion, special interest lobbies, and pressure groups as they operate on government to influence public policy.
- 151-52 *Public Administration (3-3)*
Introductory survey of the theory and practice of governmental administration and its relation to politics, legislation, the courts, and nongovernmental organizations and interests.
- 171 *International Politics (3)*
Basic forces underlying the conduct of international relations and the formation of foreign policy; power politics, imperialism, collective security, and international co-operation.
- 172 *International Organization: the United Nations (3)*
Development and current operation of international organization within the system of sovereign states with emphasis on the United Nations.
- 181 *International Law (3)*
Survey of the public law of nations with emphasis on the law of peace.
- 191 *Politics of the Middle East (3)*
Domestic and international politics of Turkey, Iran, Israel, and the Eastern Arab States and Principalities. Special attention to the specifically regional aspect of the foreign policies of these countries.
- 192 *Politics of North and Central Africa (3)*
Domestic and international politics of the Western Arab States, Ethiopia, Somalia, Liberia, and the newly independent states of former British, French, and Belgian

Africa. Special attention to the specifically regional aspect of the foreign policies of these countries.

194 *Far Eastern Politics: Contemporary International Relations in the Pacific Area* (3)

Background and development of the major states of East Asia with attention to the constitutional systems and the foreign politics of the region.

195 *Southeast Asia Today* (3)

Current political problems in South and Southeast Asia with attention to the historical, geographical, and economic backgrounds of the countries concerned; India, Burma, Thailand, Cambodia, Laos, and Vietnam (north and south).

212 *Seminar: Comparative Government* (3)

Selected topics and problems on comparative political and administrative institutions and the politics of modern constitutional governments and dictatorships. Each semester is devoted to a selected country or significant institutional or policy problem.

260 *Fundamentals of National Power** (3)

261 *International and United States Foreign Policy** (3)

262 *National Security Policy of the United States** (3)

275 *Political, Geographic, and Economic Factors in Latin American Development* (3)

The influence of political, geographic, and economic factors in shaping the history and development of Latin America. The consequence of these factors in present-day diplomacy.

283 *Topics in International Law* (3)

A consideration of theory, problems, and cases in the public law of nations, including the law of peace and the law of war.

285 *Diplomacy Since World War II* (3)

Recent changes in diplomatic procedures and objectives as compared with those of earlier periods.

299-300 *Thesis* (3-3)

PSYCHOLOGY

Executive Officer: Thelma Hunt, Ph.D., M.D., Professor of Psychology, Monroe Hall, Room 427 (2115 G Street NW.), FEderal 8-0250, Extension 283

1 *General Psychology*† (3)

The fundamental principles underlying human behavior.

4 *Psychology of Adjustment* (3)

Processes involved in the total adjustment of the individual with emphasis on social environment; development in the individual of adjustment techniques.

22 *Introduction to Educational Psychology* (3)

Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.

29 *Child Psychology* (3)

A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world.

* Available only to students in the Master of Arts in International Affairs programs at the American War College and the National War College.

† Psychology I is prerequisite to all other courses in psychology.

- 98 **Abnormal Psychology (3)**
The causes, diagnosis, treatment, and prevention of the various types of maladjustments and mental disorders. Prerequisite: 6 credits in psychology, or 3 credits in psychology and 6 credits in a biological science.
- 112 **Adolescent Psychology (3)**
Psychological characteristics and problems peculiar to adolescence, with emphasis on applications of psychology to solution of such problems.
- 125 **Mental Hygiene (3)**
A course for teachers in the application of psychological principles to classroom procedures for purposes of assisting the teacher to recognize and deal with early symptoms of maladjustment.
- 127 **Employee Counseling (3)**
Employee counseling as a management technique and its contribution to management; a survey of its basic objectives, principles, and procedures.
- 129 **Introduction to Counseling and Guidance (3)**
A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.
- 131 **Psychological Tests (3)**
A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, \$7.
- 144 **Personnel Psychology (3)**
Psychological concepts and techniques in personnel management and supervision. Applications to government, industry, and military organizations.
- 145 **Principles of Human Relations (3)**
Survey of the psychological principles involved in dealing with individuals and groups.
- 146 **Psychology of Human Relations (3)**
Consideration of the problems and process in interpersonal relations and small-group behavior. Emphasis is on interpersonal communication and perception, psycholinguistics, and cross-cultural relations.
- 148 **Psychology of Advertising and Consumer Behavior (3)**
The motivational and social processes in economic behavior. Consideration of current techniques and findings in motivational research. Evaluation of the effectiveness of mass media, public relations programs, and strategies of persuasion.
- 149 **Human Relations in Management (3)**
The purpose of the course is to create an awareness of the value and use of human relations in management; and to discuss the procedures and techniques used in applying good human relations to management. Principles of management will be discussed.
- 151 **Social Psychology (3)**
The social foundations of attitudes and behavior. Individual adjustment to group situations, such as the family, school, fraternity, and occupation. The psychological basis of race prejudice, nationalism, and war.
- 153 **Psychological Factors in Delinquency (3)**
Historical and sociological factors in delinquency; historical attitudes toward the offender, theory, and practice; patterns of failure; early preventive measures; research in delinquency prediction; rehabilitation as team work by parents, school, community, church, and (where necessary) the institution.
- 156 **Psychology of Propaganda and Public Opinion (3)**
The psychology of opinion formation, the measurement of opinion, the social determinants of attitudes, the psychological processes in propaganda, the bases of receptivity of propaganda, psychological warfare.
- 225 **Seminar: Mental Hygiene (3)**
A study of mental health problems with special attention to needs of counselors.

227 Seminar: Counseling and Guidance (3)

Recent developments and current problems in vocational, educational, and personal guidance in various types of agencies with particular reference to education. Prerequisite: educational or psychological measurements and Psychology 129 or the equivalent.

228 Seminar: Techniques of Counseling (3)

An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling problems will be discussed. Prerequisite: 12 semester hours in testing and guidance, including Psychology 229 and 236. In exceptional cases Psychology 229 or 236 may be taken concurrently with 228.

229 Seminar: Occupational and Educational Information (3)

Designed to acquaint vocational and educational counselors with the basic occupational and educational information necessary in counseling. Sources of data and techniques of collecting, analyzing, and disseminating for purposes of guidance.

230 Group Guidance Procedures in Counseling and Guidance (3)

A survey of the principles, techniques, and procedures used in group guidance with emphasis upon the development of group guidance materials. Prerequisite: a background of successful teaching experience and some current guidance responsibilities.

236 Seminar: Analysis of the Individual for Purposes of Counseling (3)

A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: an introductory course in educational or psychological measurements.

245 Seminar: Employee Motivation and Morale (3)

An analysis of organizational behavior, especially with regard to motivation and productivity. The implications of recent research on employee attitudes, the primary group, the effects of various patterns of supervisory leadership, the role of formal and informal organization, and job design.

246 Seminar: Personnel Measurement Techniques (3)

Detailed consideration of the techniques of personnel selection and performance evaluation. The use of employment tests, personal data, assessment interviews, and performance ratings.

247 Applications of Behavioral Research Methods to Personnel Management (3)

Study of the design, methods, and techniques of behavioral research as applied to the problems of personnel administration with special emphasis upon current programs of research and the translation of their results into management action.

263 Intercultural Change: a Psychological and Behavioral Approach (3)

Western impact on non-Western cultures. The workings and the processes of social change as variant cultures and ethical systems interact.

299-300 Thesis (3-3)**RELIGION**

Executive Officer: Clifton Earl Olmstead, A.B., Th.D., Professor of Religion, Building O, Room 10 (2106 G Street NW.), FEderal 8-0250, Extension 279

191 Christian Education in the Church (3)

Principles of religious education; factors conditioning Christian growth; functions of family, church, community, and state.

192 Christian Education in the Church (3)

The unified program of the church; worship, study, and service; developing lay educational leadership; housing and equipment; curriculum construction; evaluation of materials; lesson planning and teaching methods.

ROMANCE LANGUAGES AND LITERATURES

Executive Officer: William Graham Clubb, Ph.D., Associate Professor of French,
Building A, Room 23 (2026 G Street NW.), FEderal 8-0250, Extension 425

FRENCH

1-2 *First-year French* (3-3)

A year course: credit is not given for the first half until the second half is completed.
For beginners. Pronunciation, conversation, grammar, composition, reading of modern French prose.

3-4 *Second-year French* (3-3)

A year course: credit is not given for the first half until the second half is completed.
Conversation, grammar, composition, reading in modern French prose, introduction to French civilization. Prerequisite: French 1-2 or two years of high school French.

SPANISH

1-2 *First-year Spanish* (3-3)

A year course: credit is not given for the first half until the second half is completed.
For beginners. Pronunciation, conversation, grammar, composition, reading of modern Spanish prose.

3-4 *Second-year Spanish* (3-3)

A year course: credit is not given for the first half until the second half is completed.
Conversation, grammar, composition, reading of modern Spanish prose, introduction to Hispanic civilization. Prerequisite: Spanish 1-2 or two years of high school Spanish.

SECRETARIAL STUDIES

Executive Officer: Mildred Hollander Shott, A.M., Associate Professor of Secretarial
Studies, Monroe Hall, Room 300 (2115 G Street NW.), FEderal 8-0250, Extension
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1 *Elementary Typewriting* (3)

Fundamental techniques of typewriting, basic styles of business letters, introduction to tabulation, and preparation of general office forms.

2 *Intermediate Typewriting* (3)

The business letter and its arrangement, advanced tabulation, manuscript typing, office forms, stencil cutting, and legal documents. Prerequisite: Secretarial Studies 1 or the equivalent; ability to type accurately at 30 words a minute.

11 *Elementary Shorthand and Transcription* (3)

A study of the principles of Gregg shorthand correlated with dictation and transcription. Minimum dictation speed of 60 words a minute attained.

12 *Intermediate Shorthand and Transcription* (3)

Review of the principles of Gregg Shorthand. Dictation and transcription on general and specialized business subjects. Minimum dictation speed of 80 words a minute attained. Prerequisite: Secretarial Studies 11 or the equivalent; ability to take dictation at 60 words a minute.

15 *Advanced Shorthand, Typewriting, and Transcription* (3)

Dictation and transcription involving vocabularies in specific businesses. Minimum speed of 100 words a minute attained in dictation. Prerequisite: Secretarial Studies 12 or the equivalent.

16 *Secretarial Shorthand, Typewriting, and Transcription* (3)

Dictation and transcription involving vocabularies used in the legal and medical professions. Minimum dictation speed of 120 words a minute attained. Prerequisite: Secretarial Studies 15 or the equivalent.

51 Business Correspondence (3)

Development of the technique of effective communication with reference to business letters and forms. Survey and analysis of current business literature.

54 Secretarial Practice (3)

A thorough study of secretarial problems and procedures. Practice in the use of secretarial equipment and supplies. The study of secretarial personality and office relationships.

SLAVIC LANGUAGES AND LITERATURES

Executive Officer: Helen Bates Yakobson, B.S., Associate Professor of Russian Building M, Room 12 (716 Twenty-first Street NW.), FEderal 8-0250, Extension 275, 496

1-2 First-year Russian (3-3)

A year course: credit is not given for the first half until the second half is completed. A beginner's course in fundamentals of grammar and pronunciation with graded reading, oral drill, and written practice. Listening comprehension and oral practice.

3-4 Second-year Russian (3-3)

A year course: credit is not given for the first half until the second half is completed. Systematic review of grammar. Study of special problems of Russian morphology and syntax. Oral and written reports on assigned topics.

9-10 Russian Conversation (3-3)

Listening comprehension and oral practice.

103-4 Scientific Russian (3-3)

Reading and translation of technical texts.

SOCIOLOGY AND ANTHROPOLOGY

Executive Officer: Harold Loran Geisert, Ph.D., Professor of Sociology and Anthropology, Building X, Room 12 (2107 H Street NW.), FEderal 8-0250, Extension 387

1-2 Man in Modern Society* (3-3)

Development of culture and personality, the impact of groups and institutions on man's social behavior. Factors producing social problems; individual, community, national and international disorganization.

51 Introduction to Anthropology* (3)

Physical development of fossil and living man, races of mankind, the origin and growth of civilization; the structure and development of human relationships.

126 Urban Sociology (3)

The place of the city in the larger society: growth of the city, problems of urban living, group life, personality, urban housing, and city planning. Includes consideration of suburban development.

127 Community Organization (3)

Principles common to communities throughout the world: social interaction and social disorganization, population growth and community structure, spatial organization, community change.

131 Social Institutions (3)

Functional analysis of basic social institutions: family, education, religion, and state in the structure of American society.

132 Courtship and Marriage (3)

Dating and courtship as social processes, reasons for marriage, marriage laws, mate selection, factors in marital adjustment; prediction and counseling.

* Sociology and Anthropology 1 or 51 is prerequisite to all other courses in Sociology and Anthropology.

- 135 *Juvenile Delinquency* (3)
Factors producing delinquency, juvenile detention, the juvenile court, training schools, treatment of offenders.
- 136 *Criminology* (3)
Nature and distribution of crime, police and court systems, prisons and reformatories, treatment and prevention of crime.
- 141 *Population Problems* (3)
Composition of populations, trends in population growth and population pressure, factors producing population movements, effects of migration, population policies: eugenics and birth control.
- 142 *Race and Culture Configurations* (3)
The biological background; the origin and races of mankind, and the social and cultural effects of concepts of race.
- 162 *Social Movements* (3)
Major contemporary movements examined as aspects of social change and collective behavior. Designed to disclose competing ideologies and show the way social movements develop.
- 164 *Social Control* (3)
Informal and formal phases of human control, analysis of methods of control used in modern society and the situations in which they occur, policies and techniques of control.
- 172 *Contemporary Social Theory* (3)
Systematic study of the important schools of contemporary sociology, including recent European as well as American developments; an evaluation of the scientific contributions of each school.
- 221 *Seminar: Current Trends in Sociology* (3)
Analysis and evaluation of recent developments in sociology, and an appraisal of the role of systematic theory in sociology.

SPEECH

Executive Officer: Lubin Poe Leggett, A.M., Ed.D., Depew Professor of Speech, Lisner Auditorium, Room 2 (730 Twenty-first Street N.W.), Federal 8-0250, Extension 293

- 1 *Effective Speaking* (3)
Preparation and delivery of extempore speeches, developing confidence and poise, body and voice control; selecting and organizing material. Recording fee, \$2.
- 2 *Persuasive Speaking* (3)
A continuation of Speech 1, which is prerequisite, with emphasis on speech composition and elementary principles of persuasion.
- 11 *Voice and Diction* (3)
Developing ease, naturalness, and clarity in the speaking voice. Analysis of individual voices through recordings. Phonetic approach to the study of the sounds of English, the standards of speech. Class instruction in the problems of rate, volume, pitch, and quality. Recording fee, \$4.
- 111 *Effective Speech Communication** (3)
The tools and principles of effective speech communication, including practice in the organization, delivery, and the evaluation of presentations commonly encountered by professional personnel. Not open to speech majors.
- 121 *Group Discussion and Conference Leadership* (3)
The process of thinking and problem solving in committees and small groups, and the

* This course can be adapted to the needs of a specific group.

methods of leading discussions and conferences. Prerequisite: 6 hours of speech and the permission of the instructor.

169-70 Creative Dramatics and Children's Theater (3-3)

A study of creative dramatics and its use as a learning tool, with problems and experience in producing children's plays.

STATISTICS

Executive Officer: Harold Frederick Bright, Ph.D., Professor of Statistics, Hall of Government, Room 401 (710 Twenty-first Street NW.), FEderal 8-0250, Extension 296

51 Introduction to Business and Economic Statistics* (3)

Lecture (2 hours), laboratory (2 hours). Survey of elementary principles and procedures for presenting, analyzing, and interpreting statistical data; consideration of characteristic values; measures of variability, sampling processes, index numbers, time series analysis, and simple correlation. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

52 Mathematics of Finance† (3)

Lecture (2 hours), laboratory (2 hours). Interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.

58 Mathematics of Business Administration (3)

Lecture (2 hours), laboratory (2 hours). Study and problems in procedures of interest and discount, annuities, valuation of stocks and bonds, sinking funds, amortization, valuation of depletable assets, depreciation. Prerequisite: one entrance unit in algebra. (This course offered off campus only.)

91 Principles of Statistical Methods (3)

Variates and attributes, averages and dispersion, frequency distributions and their characteristics, regression and correlation, statistical decision processes. (This course is offered on campus only.)

101 Basic Principles of Statistical Methods I (3)

Variables and attributes, averages and dispersion, elementary principles of sampling introduction to the making of statistical decisions. (This course is offered both on and off campus.)

102 Basic Principles of Statistical Methods II (3)

Continuation of Statistics 101 and includes topics in analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 101 or permission of the instructor. (This course offered off campus only.)

106 Factor Analysis (3)

Matrix theory as applied to factor analysis, introduction to the concepts of factor analysis and their utility in various phases of research. Prerequisite: Statistics 51 or the equivalent. Laboratory fee, \$9.

109 Managerial Statistics (3)

Role of statistics and the contribution of statistical procedures in various phases of business management with emphasis on the need for and usefulness of the statistical method rather than the mechanics of analysis. Subject matter comprises sources and methods for collecting data, effective forms of presentation, techniques for summarizing and analyzing quantitative and qualitative information, interpretation, and inferences from available data. Admission by permission of the instructor or following Statistics 51.

* Statistics 51 is offered only on campus. However, Statistics 101 and 102: *Basic Principles of Statistical Methods, I and II* (3-3), which is offered off campus, may be substituted.
† Statistics 52 is offered only on campus. However, Statistics 58, *Mathematics of Business Administration* (3), which is offered off campus, may be substituted.

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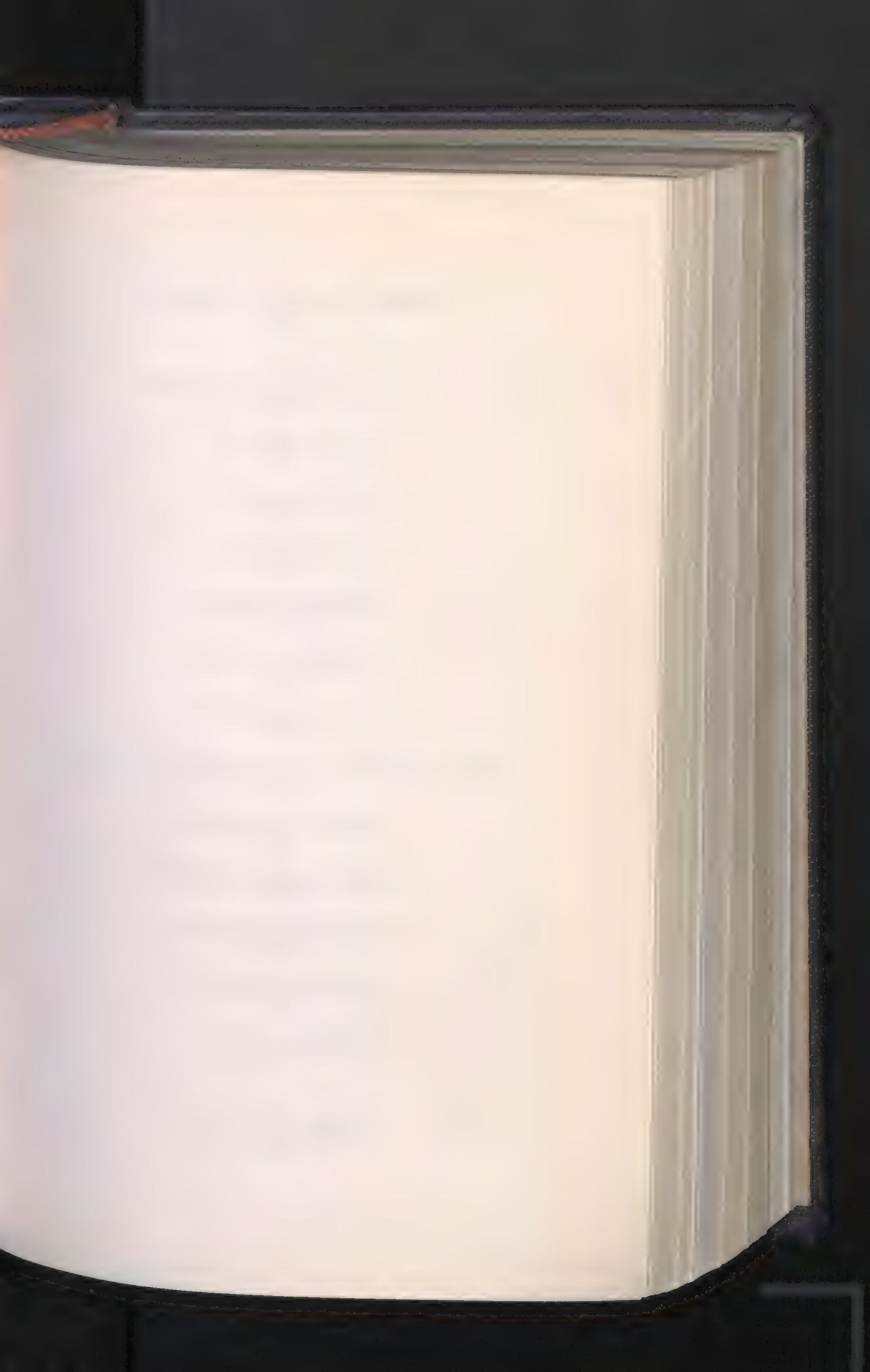
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THE GEORGE WASHINGTON UNIVERSITY
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1821

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1893

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1825

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1865

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1884

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1906

The School of Education
1907

The School of Government, Business, and International Affairs
1928

The College of General Studies
1950

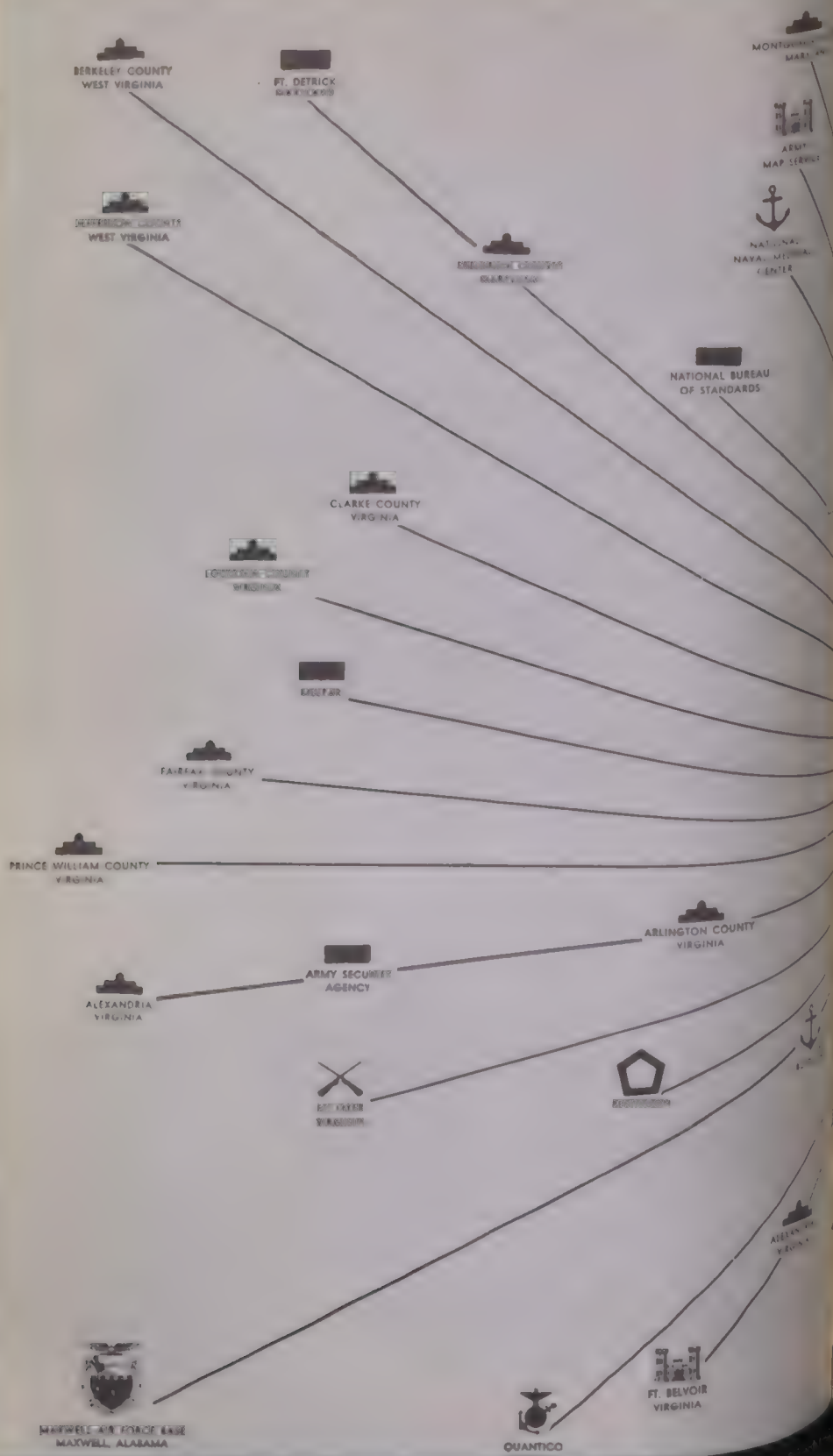
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1930

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1944

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1951

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1916

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1898



THE
GEORGE
WASHINGTON
UNIVERSITY

BULLETIN

THE SCHOOL OF MEDICINE
1961-62



WASHINGTON 6, D. C.
OCTOBER 1960

VOL. LX

No. 1

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Detailed information may be obtained by addressing inquiries as indicated below. For any information not included here, please write to the Director of Admissions, The George Washington University, Washington 6, D. C.

Information concerning courses of instruction and the programs of the several colleges and schools will be found in separate issues of the University Bulletin, which are listed on the inside back cover.

| | |
|--|---|
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| Alumni Association..... | Office of Alumni Relations, Bacon Hall |
| Foreign Students..... | Adviser to Foreign Students, Building T |
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School of Medicine—Research and Administration Buildings



View of the University of Virginia, Charlottesville, Virginia

THE SCHOOL OF MEDICINE

1961 - 62

THE
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WASHINGTON
UNIVERSITY
BULLETIN

VOL. LX

No. 1

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WASHINGTON, D. C.

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CALENDAR OF THE SCHOOL OF MEDICINE

1961-62

FALL SEMESTER:

| | 1961 | |
|-----------------------------|----------------------|-------------|
| Registration | Sept. 14 | Thurs. |
| Classes begin | Sept. 18 | Mon. |
| Veterans Day. Holiday | Nov. 11 | Sat. |
| Thanksgiving recess | Nov. 23-25 | Thurs.-Sat. |
| Christmas recess | Dec. 22-Jan. 2 | Fri.-Tues. |

1962

| | | |
|---------------------------------------|------------------|-----------|
| Classes resume | Jan. 3 | Wed. |
| Tuition for spring semester due | Jan. 12 | Fri. |
| Examination period | Jan. 22-27 | Mon.-Sat. |

SPRING SEMESTER:

| | | |
|--|-----------------------|---------------|
| Classes resume for spring semester | Jan. 29 | Mon. |
| Winter Convocation. Holiday | Feb. 22 | Thurs. |
| Easter recess | April 20 and 21 | Fri. and Sat. |
| Examination period | May 21-29 | Mon.-Tues. |
| Memorial Day. Holiday | May 30 | Wed. |
| Baccalaureate Service | June 3 | Sunday |
| Commencement | June 6 | Wed. |
| Registration for the academic year 1962-63 | Sept. 13 | Thurs. |

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* For the academic year 1960-61.

THE UNIVERSITY

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

The George Washington University operates under a charter granted by an act of Congress of February 9, 1821, to Columbian College in the District of Columbia. In 1873 the name was changed to "Columbian University" and in 1904 to "The George Washington University".

The University as it is now organized consists of the Junior College, comprising the work of the freshman and sophomore years; Columbian College, the senior college of liberal arts, which offers work leading to the Bachelor's and Master's degrees; the Graduate Council, which offers work leading to the degree of Doctor of Philosophy; the professional schools, which include Medicine, Law, Engineering, Pharmacy, Education, and Government; the College of General Studies; the Division of University students; the Division of Special Students; the Division of Air Science; and the Summer Sessions.

The George Washington University is a privately endowed University located on a well planned campus in the center of Washington within a few blocks of the White House. The government and educational management of the University are vested in a self-perpetuating Board of Trustees, with the President of the University serving as an ex officio member of the Board.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The School of Medicine has had continuous approval by the Council on Medical Education of the American Medical Association and the Association of American Medical Colleges. The degree of the School of Medicine is recognized by all State Examining Boards.

LOCATION

The University is in downtown Washington within a few blocks of the White House and the Federal Triangle of Government buildings, which house many of the departments of the Federal Government, and such museums of special interest to medical students as the Smithsonian Institution, the National Museum, and the Botanic Gardens.

THE SCHOOL OF MEDICINE

THE SCHOOL OF MEDICINE

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Administrator of the University Hospital V. F. Ludewig

COMMITTEES‡

THE DEAN'S COUNCIL

Brian Blades, T. M. Peery, I. R. Telford, J. W. Watts, V. F. Ludewig

COMMITTEE ON ADMISSIONS

Paul Calabrisi, *Chairman*

H. G. Mandel, Ruth McClintock, W. P. McKelway, F. N. Miller, Jr., J. E. Rankin

COMMITTEE ON CURRICULUM

T. M. Peery, *Chairman*

C. A. M. Hogben, M. J. Romansky, J. G. Sites, I. R. Telford, J. R. Thistlethwaite, C. R. Treadwell

COMMITTEE ON SCHOLARSHIP

I. R. Telford, *Chairman*

Brian Blades, T. M. Brown, C. A. M. Hogben, T. M. Peery

COMMITTEE ON RESEARCH

C. R. Treadwell, *Chairman*

J. M. Evans, T. N. Johnson, H. L. Ley, Jr., H. C. Pierpont, Harold Stevens

COMMITTEE ON LIBRARY

C. E. Leese, *Chairman*

Seymour Alpert, S. W. Bush, H. G. Mandel, Mary Robbins

COMMITTEE ON GRADUATE AND POSTGRADUATE STUDY

T. M. Brown, *Chairman*

R. H. Barter, Brian Blades, C. S. Coakley, Leon Yochelson, V. F. Ludewig

* Faculty and committee members listed here are for the academic year 1960-61.

† The President of the University, the Dean of Faculties of the University, and the Registrar of the University are members of the Faculty.

‡ The Dean of the School of Medicine and Associate Deans are members ex officio of all committees.

COMMITTEE ON APPOINTMENTS AND PROMOTIONS

Brian Blades, *Chairman*

T. M. Peery, C. R. Treadwell

ADVISORY COMMITTEE ON CANCER RESEARCH

L. K. Alpert, *Chairman*

Frank Allan, J. M. Bailey, J. K. Cromer, C. T. Klopp, William Newman, Mary Robins, W. W. Saunders

ADVISORY COMMITTEE ON REHABILITATION

C. S. Wise, *Chairman*

J. P. Adams, T. M. Brown, J. M. Evans, Irene Tamagna, J. R. Thistlethwaite

GENERAL INFORMATION

INTRODUCTION

The School of Medicine of The George Washington University was opened in March 1825. Of the medical schools now in existence in the United States, it is the eleventh in chronological order of founding. The University Hospital and Dispensary were established in 1898 as a part of the organization of the School. The present George Washington University Hospital was opened in 1948, and the Helen L. and Mary E. Warwick Memorial Building housing the Cancer Clinic was completed in 1954. Additional clinical facilities are used at the District of Columbia General Hospital, Children's Hospital, St. Elizabeths Hospital, and Mt. Alto Veterans Administration Hospital. The School of Medicine maintains close affiliation not only with the various divisions of the University, but also with the numerous medical research and scientific establishments of the federal government in the Nation's Capital. Washington provides world renowned library facilities, comprehensive museums, and excellent recreational facilities which are available to students.

OBJECTIVES

The purpose of the School of Medicine is to prepare men and women in the art and science of medicine to meet the health needs of a growing, ever changing society. It is the responsibility of the School of Medicine to provide its students with a systematic plan of instruction in the basic medical sciences, with well guided clinical experience, with opportunities for expression in research, and with a philosophy in keeping with the highest ethics of the profession.

To achieve these objectives the School of Medicine has developed a progressive plan of instruction and a balanced, comprehensive curriculum. To carry out the program the University maintains a faculty of adequate size and of outstanding ability and makes use of facilities which provide exceptional opportunities for research and clinical training.

PLAN OF INSTRUCTION

The curriculum is a progressive one, beginning with basic medical science and expanding to include the more complex aspects of the prevention of disease and care of the sick. The teaching program is organized under the various departments of the School of Medicine. (See "Courses of Instruction", pages 47-67.)

The schedule for the first year begins with an orientation week designed to introduce the new students to the Faculty, to the upperclassmen, and to the environment for their medical education. The students meet for informal panel discussions with upperclassmen and members of the Faculty on such subjects as curriculum, medical terminology, use of library facilities, ethics and aims of the medical profession, and student health.

First year instruction is given in anatomy, biochemistry, and physiology using the classroom and laboratory facilities of the School of Medicine. Early in their medical careers students are encouraged to participate in research.

Having completed the preliminary study of structure and function of the normal body, the student progresses in the second year to a consideration of disease processes and mechanisms. The various microbial agents capable of causing disease are studied in the course in microbiology, and the effect of these and other harmful substances upon the body are studied in the course in pathology. The modes of action of various therapeutic agents are considered in the course in pharmacology. Introductory lectures and demonstrations in the clinical sciences are given during the second semester in order to prepare the student for the responsibilities of the following year.

In the third year the student is assigned to the District of Columbia General Hospital for lectures, conferences, and clinical studies. He serves in the various divisions of the hospital assisting in the preparation of clinical records and performing certain clinical laboratory examinations. He learns to apply diagnostic and therapeutic procedures in the care of patients. During this period instruction is individual or in small groups. The instructor reviews the student's observations at the bedside and guides him in the development and application of his knowledge.

During the following summer each fourth year student is required to spend eight weeks in one of the clinical facilities of the School of Medicine. In the fourth year the student's responsibility for inpatient care continues and enlarges, but at least an equal part of his time is spent in the study and care of clinic patients. The University Hospital, the District of Columbia General Hospital, Children's Hospital, Mount Alto Veterans Administration Hospital, and St. Elizabeths Hospital provide the student with experience in many fields. In this final year of formal medical education stress is placed upon the total patient and his environment so that emotional and economic as well as physical factors may be considered in the restoration of the individual to a state of health and happiness.

Upon satisfactory completion of the four-year course of the School of Medicine, the student is well prepared for graduate training leading to a career in general or specialty practice, research, medical education, or government service.

THE CURRICULUM

| Subject | Lecture | Laboratory or Clerkship | Conference | Total |
|--|---------|-------------------------------|------------|-------|
| FIRST YEAR | | | | |
| Gross Anatomy | 85 | 210 | — | 295 |
| Embryology and Histology | 60 | 120 | — | 180 |
| Neuroanatomy | 32 | 56 | — | 88 |
| Biochemistry | 76 | 180 | 32 | 288 |
| Physiology | 112 | 152 | 32 | 296 |
| Biostatistics | 16 | — | — | 16 |
| Disaster Medicine | 16 | — | — | 16 |
| Introductory Medical Psychology | 16 | — | — | 16 |
| Psychopathology | 16 | — | — | 16 |
| Total | 429 | 718 | 64 | 1,211 |
| SECOND YEAR | | | | |
| Microbiology | 64 | 144 | 16 | 224 |
| Pathology | 64 | 136 | 32 | 232 |
| Pharmacology | 40 | 80 | 24 | 144 |
| Physical Diagnosis | 16 | 96 | — | 112 |
| Psychiatry | 32 | 48 | — | 80 |
| Clinical Microscopy | 16 | 32 | — | 48 |
| Medicine | 48 | — | — | 48 |
| Surgery | 32 | — | — | 32 |
| Community Health | 32 | — | — | 32 |
| Pediatrics | 32 | — | — | 32 |
| Neurology | 32 | — | — | 32 |
| Obstetrics and Gynecology | 16 | — | — | 16 |
| Radiology | 16 | — | — | 16 |
| Forensic Pathology and Medical Jurisprudence | 16 | — | — | 16 |
| Dermatology | 16 | — | — | 16 |
| Total | 472 | 536 | 72 | 1,080 |

| Subject | Lecture, Conference or Clinic | Laboratory or Clerkship | Total |
|--|-------------------------------------|-------------------------------|-------|
| THIRD YEAR | | | |
| Anesthesiology | 16 | — | 16 |
| Clinical Pathological Conference | 16 | — | 16 |
| Medicine | 64 | 240 | 304 |
| Medical Laboratory | — | 60 | 60 |
| Neurology | 16 | 60 | 76 |
| Obstetrics and Gynecology | 96 | 120 | 216 |
| Ophthalmology | 16 | — | 16 |
| Pediatrics | 32 | 120 | 152 |
| Physical Medicine | 16 | — | 16 |
| Psychiatry | 16 | — | 16 |
| Radiology | 16 | — | 16 |
| Surgery | 112 | 240 | 352 |
| Otolaryngology | 16 | — | 16 |
| Admitting and Emergency | — | 120 | 120 |
| Therapeutic Conference | 32 | — | 32 |
| Urology | 16 | — | 16 |
| Total | 480 | 960 | 1,440 |

SUMMER CLERKSHIP

Medicine, Surgery, Obstetrics and Gynecology or Pediatrics—eight weeks between third and fourth years.

FOURTH YEAR

| | | | |
|--|-----|-------|-------|
| Cancer Clinics | — | 120 | 120 |
| Clinical Pathological Conference | 28 | — | 28 |
| Forensic Medicine | 12 | — | 12 |
| Medicine | — | 360 | 360 |
| Obstetrics and Gynecology | — | 240 | 240 |
| Pediatrics | 28 | 240 | 268 |
| Psychiatry | — | 120 | 120 |
| Public Health Practice | 5 | — | 5 |
| Surgery | — | 360 | 360 |
| Surgical Anatomy | 15 | — | 15 |
| Surgical Pathology | 12 | — | 12 |
| Total | 100 | 1,440 | 1,540 |

EQUIPMENT AND FACILITIES

Medical School Building.—The building housing the School of Medicine is a five-story structure with lecture rooms, classrooms, students' rooms, and the following laboratories: anatomy; biochemistry; microbiology and community health; pathology; pharmacology; and physiology.

They are fully equipped to enable students to pursue adequately the laboratory courses and to acquire the technical skill necessary in modern clinical and investigative work.

Research and Administration Building.—The Research Building houses special laboratories for graduate and staff research in the departments of Anatomy; Biochemistry; Microbiology and Community Health; Pharmacology; and Physiology. Special facilities are provided for the study of radioactive compounds, for tissue-culture techniques, and the virologic procedures. Selected students are invited to participate in certain aspects of the research program either on a volunteer basis or with the support of special Research Scholarships.

On the first floor, the west wing is occupied by a modern medical library; the east wing houses the administrative offices of the School of Medicine. Photographic laboratories and other facilities for audiovisual aids to education are on the second floor.

Medical Library.—The Medical Library in well-equipped quarters on the first floor of 1339 H Street, NW., contains 23,000 carefully selected volumes, including the new medical works and the principal medical journals.

Interlibrary loan service is maintained with other medical and scientific libraries.

The Medical Library is open from 9:00 A.M. to 10:00 P.M. each class day, Monday through Friday, and from 9:00 A.M. to 5:00 P.M. Saturday.

A branch of the Medical Library is maintained in the University Hospital for the use of the resident physicians, interns, and students. It is open Monday through Friday, 1:00 to 5:00 P.M. and 6:00 to 11:00 P.M. During the academic year the library is also open Saturday and Sunday from 1:00 to 5:00 P.M.

The George Washington University Hospital.—This 425-bed hospital is staffed and directed by the Faculty of The George Washington University School of Medicine. It provides excellent clinical opportunity for the instruction of medical students. Practically every specialty in the fields of medicine and surgery has assigned space and equipment in both the outpatient department and the bed-patient section of this modern hospital.

GOVERNMENT MUSEUMS

The Armed Forces Institute of Pathology, on the grounds of Walter Reed Army Medical Center, affords unexcelled opportunity for study of conditions met in general medicine and surgery as well as those of special military significance. Its collection of anatomical and pathological specimens comprises material received from all areas of the world and is unequaled in this country. The Museum of Hygiene, the National Museum, the Smithsonian Institution, the Botanic Gardens, and the various collections of the Department of Agriculture all afford opportunity for study of materials of special interest in various areas of Medicine and its allied sciences.

CLINICAL FACILITIES

Students at The George Washington University School of Medicine receive clinical training at the University Hospital, at the University Cancer Clinic, and at four affiliated hospitals.

The George Washington University Hospital.—The Medical Director and Chiefs of Services are responsible for the supervision of patient care. The individual student has direct responsibility to patients under supervision. Clinical and clinical pathological conferences are held in which the history of patients, the physical findings, laboratory records, and the post-mortem pathology, are presented and correlated.

The University Clinics.—The University Clinics have facilities for each Service in the Hospital. Fourth-year students are assigned in rotation by section for instruction in the University Clinics.

The George Washington University Cancer Clinic.—The Helen L. and Mary E. Warwick Memorial building, opened in 1954, houses the Cancer Detection Clinic and special laboratories for research related to the nature, diagnosis, and treatment of cancer.

The facilities of the Cancer Detection Clinic are used for teaching medical students. The diagnosis and treatment of various forms of neoplasms are presented. The results of treatment are evaluated by follow-up studies.

District of Columbia General Hospital.—Washington's large city hospital has an annual census of 24,178 inpatients and 211,835 outpatients. It provides clinical opportunities in every branch of medicine and surgery.

Children's Hospital.—This is one of the largest and best known hospitals for children in the United States. Medical students receive training and clinical experience in pediatrics on both clinic and inpatient services.

St. Elizabeths Hospital.—This hospital provides care for approximately 8,000 patients a year with nearly every known psychiatric and neurologic disorder. The George Washington University medical students begin their studies in psychiatry in their first year and these studies continue throughout the four years. Prominent psychiatrists and neurologists on the St. Elizabeths staff are members of The George Washington School of Medicine faculty.

Additional clinical experience in psychiatry is gained by students at The George Washington University Hospital and in the University Clinics. Special lectures and clinical work in child psychiatry are given in Children's Hospital.

Mt. Alto Veterans Administration Hospital.—Clinical experience in both medicine and surgery is provided at this Veterans Administration hospital.

ADMISSION

APPLICATION FOR ADMISSION

1. Full directions for application will be furnished on request. The applicant should ask the registrar of each college previously attended to send an official transcript of record to the Director of Admissions, The George Washington University, 2029 G Street NW., Washington 6, D. C. Photostatic copies of credentials without the original signature of the certifying authority are not satisfactory. It

is the responsibility of the applicant to see that all credentials are forwarded to the Director of Admissions of the University.

2. Two recent photographs, with signatures, are required of each applicant.

3. Applicants for admission are required to take the Medical College Admission Test, sponsored by the Association of American Medical Colleges, in advance of the academic year for which application is made.

4. A fee of \$10 to defray the cost of completing the records for consideration by the Committee on Admissions must accompany each application. This fee applies to students whose premedical training was completed at this University as well as to students who have not previously attended this University.

ENTRANCE REQUIREMENTS

College Courses

Chemistry:

Inorganic (including 4 hours of laboratory) 8

Qualitative analysis may be counted as part of this requirement. 6-8

Organic (including laboratory)

The equivalent of a one-year college course

Biology (including 4 hours of laboratory) 8

A course in either general biology or zoology

Physics (including at least 2 hours of laboratory) 8

English Composition and Literature 6

With the exception of these specific requirements applicants are urged to follow their personal interests in developing their premedical courses of study. A well-balanced program, rather than a specific field, is the criterion by which an applicant is judged. It is not advisable to take courses that appear to cover subject matter in the medical program.

While well-qualified candidates are eligible for admission after completing the minimal 90 semester-hour requirement, the majority of applicants are found to be better qualified for the study of medicine after four years of college work.

ADVANCED STANDING

A student who has satisfactorily completed part of the requirements for the degree of Doctor of Medicine may apply for advanced standing if his work has been equivalent to that required by The George Washington University School of Medicine. Before final admission to the third year class, the applicant must have passed Part I of the National Board Examinations.

SELECTION PROCEDURES

The Committee on Admissions is guided in the selection of students by the applicant's academic ability, the results of the Medical College Admission Test, and personal qualifications as determined by letters of reference and personal interview. Applicants are interviewed on invitation by the Committee.

Each applicant is notified of the Committee's decision as soon as possible.

An applicant who is offered a place in a class is required, within two weeks, to notify the Director of Admissions of his intent to accept the place reserved for him. A deposit of \$100 must be remitted not later than January 15th prior to the

opening of classes of the academic year for which he applied. This deposit will not be refunded after January 15th. It will be credited toward the tuition for the first semester.

Accompanying the offer of a place in class will be forms for a report on physical condition. This report must be completed and returned to the Director of Admissions by the applicant's physician within two months of receipt of the letter of acceptance.

REGISTRATION

For the academic year 1961-62, registration will be conducted at the Medical School, 1335 H Street NW., from 10:00 A.M. to 4:00 P.M., September 14. Registration is for a period of one academic year.

FEES AND FINANCIAL REGULATIONS

The following fees have been adopted:

| | |
|--|----------|
| Application fee..... | \$ 10.00 |
| Tuition fee, for each academic year..... | 1,200.00 |
| Fee for special examinations, for each subject..... | 5.00 |
| Residence fee, charged each student granted "leave of absence" status for the academic year in the School of Medicine..... | 50.00 |
| Graduation fee..... | 25.00 |

PAYMENT OF FEES

Fees for the year are \$1,200, payable in two installments of \$600 each in advance of the beginning of each semester.

All fees are payable at the Office of the Cashier of the University, 725 Twenty-first Street, NW., except as some other arrangement may be announced. Amounts due must be paid on or before registration day for the fall semester and on or before such date as may be announced by the Office of the Treasurer for the spring semester. (See the Calendar.)

Registration in the School of Medicine is for the full academic year. After a student has entered the courses of instruction he is obligated for the full tuition. Acceptance by the School of Medicine of a student's fees does not in any way obligate the School to accept the student for any subsequent year and the right is reserved to require the withdrawal of any student whenever, in the interest of the student or the School, the Faculty deems it advisable to do so.

Credit for work will not be given until, at the completion of a laboratory course, the student has replaced or paid for all articles of equipment or other University property which he has lost, broken, or destroyed. All breakage or loss not directly traceable to an individual student is assessed pro rata.

COST OF TEXTBOOKS AND STUDENT EQUIPMENT

The minimum cost of necessary textbooks and student equipment (microscope, drawing materials, glass slides, clinical thermometer, stethoscope, hemocytometer, uniforms, etc.) is approximately as follows: first year, \$500; second year, \$250; third year, \$125; fourth year, \$80; total \$955.

A fee of \$1 a semester is charged for the use (optional) of a locker.

SCHOLARSHIPS, PRIZES, FINANCIAL AID

The following scholarships, prizes, and loan funds are limited to students in the School of Medicine. The University offers many others which are open to medical students. A special bulletin containing a complete list and full information may be obtained from the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D.C.

SCHOLARSHIPS

Scholarships are awarded for the academic year unless otherwise specified and are credited in equal parts for each semester. Each holder must carry a full schedule of academic work during the period for which the scholarship is awarded. Applicants must have established an academic record in courses at this institution and should apply on prescribed forms which must be filed in the Office of the Chairman of the Committee on Scholarships not later than April 1 preceding the academic year for which the scholarship is to be awarded.

Anna Bartsch Hospital Intern Scholarship.—This scholarship, in the amount of \$180, established in 1946 by Dr. Anna Bartsch-Dunne as a memorial to her mother, Anna Bartsch, is available to a woman intern in The George Washington University Hospital. Award is made upon the recommendation of the Hospital's Internship Committee.

Anna Bartsch Medical Student Scholarship.—This scholarship, in the amount of \$500, established in 1946 by Dr. Anna Bartsch-Dunne, as a memorial to her mother, Anna Bartsch, is available to a woman in the School of Medicine, "of outstanding scholarship, character, and promise, who intends to make the practice of medicine her life profession." The award is made upon the recommendation of the Faculty of the School of Medicine.

Everett Lamont Bradley Scholarship.—This scholarship, in the amount of \$175, established in 1954, by bequest of Alice R. H. Bradley in memory of her son, Everett Lamont Bradley, is available to a student in the School of Medicine.

Research Scholarships and Traineeships.—These Scholarships and Traineeships permit students to participate in the research programs of the School of Medicine or to receive special training in research methods. Research scholarships are ordinarily awarded for full-time activity during the summer months; research traineeships support part-time work during the academic year. Scholars are "matched" with members of the faculty in accordance with their mutual interests. Trainees are designated by the departments responsible for the programs. These programs have been sponsored by the National Institutes of Health, the National Foundation, Lederle Laboratories, and the Tobacco Industry Research Committee.

University Hospital Scholarships in Medical Technology.—Ten scholarships are available, each to cover the cost of 24 semester hours of the 30 in the last year of the curriculum leading to the degree of Bachelor of Science in Medical Technology.

PRIZES

Allie S. Freed Prize.—This prize of \$40 established in 1957 by Mrs. Allie S. Freed, is awarded annually to a member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Preventive Medicine.

Alec Horwitz Prize.—This prize of \$100 established in 1959 by Dr. Alec Horwitz is awarded annually to a member of the senior class who has demonstrated exceptional proficiency in the field of surgery.

Huron W. Lawson Prize.—This prize of \$100 established in 1957 by Mrs. Huron W. Lawson in memory of her husband, Dr. Huron W. Lawson, who was a distinguished member of the Medical Staff of The George Washington University, is awarded annually to a member of the graduating class in the School of Medicine who has demonstrated exceptional proficiency in the field of Obstetrics and Gynecology.

Julius S. Neviaser Prize in Orthopedic Surgery.—This prize of \$100, established in 1956 by Dr. Julius S. Neviaser, is awarded annually to the student of the junior class of the School of Medicine who scores the highest grade in a written examination in Orthopedics.

John Ordroneaux Prize.—This prize of \$140 is awarded annually to the member of the graduating class of the School of Medicine who has the highest scholastic standing.

FINANCIAL AID

The following loan funds are available to students in the University in accordance with the qualifications placed thereon by the donors. Inquiries should be directed to the Office of the Treasurer.

University Loan Fund.—The Trustees of The George Washington University have made available a fund for short-term loans to students to provide for partial payment of tuition. Applications for these loans must be made three days prior to the dates on which tuition installments are due.

Joseph H. Himes Loan Fund.—This fund contributed by Joseph H. Himes is available for loans to students in the School of Medicine.

Kellogg Medical School Loan Fund.—The W. K. Kellogg Foundation in Battle Creek, Michigan, has established a loan fund for students in the School of Medicine.

School of Medicine Loan Fund.—This fund, largely contributed by medical students, is available for loans to students in the School of Medicine.

Pfizer Medical School Loan Fund.—Chas. Pfizer & Co., Inc., has established a fund for loans to students in the School of Medicine.

Sutherland Medical School Loan Fund.—This fund, established by Mrs. Rose L. Sutherland, is available for loans to students in the School of Medicine.

REGULATIONS

ATTENDANCE

A student is not permitted to attend classes until registration has been completed and fees due have been paid. Regular attendance is required.

GRADES

The following grading system is used *A* (90-100); *B* (80-89); *C* (75-79); *D* (65-74) condition; *F* (below 65) failure; *I* (incomplete), the passing grade in each subject is *C* or above.

A student conditioned in any subject will not be advanced until such condition is removed and then only by authority of the Faculty.

EXAMINATIONS

Examinations, which may be written, oral, or practical, will be held during and at the end of each semester.

All students in the School of Medicine are required to take Part I and Part II of the National Board Examinations.

GRADUATION

Application for Graduation

Application for a degree should be filed in the Office of the Registrar by March 1 of the senior year.

Presence at Graduation

A candidate is required to be present at the graduation exercises unless written application for graduation *in absentia* is approved by the Dean.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable.

THE DEGREE OF DOCTOR OF MEDICINE

Upon the satisfactory completion of the requirements of the School of Medicine, the degree of Doctor of Medicine is conferred.

COMBINED ARTS AND MEDICINE CURRICULUM

In order to be recommended for the degree of Bachelor of Arts, the candidate must complete, at least 90 semester hours of prescribed college work (at least 30 hours and one year of residence must be completed in Columbian College, the senior liberal arts college), and the first year of the medical curriculum. Upon satisfactory completion of the fourth year of the medical curriculum the student becomes eligible for the degree of Doctor of Medicine.

REQUIREMENTS FOR THE DEGREE

Every candidate for graduation with the degree of Doctor of Medicine must be at least twenty-one years of age, and free of all indebtedness to the University. He must have completed satisfactorily not less than four academic years of study as a matriculated student in Medicine, completed all required courses, and passed satisfactorily all prescribed examinations.

HONORS

A candidate who has completed the four-year medical course with an average grade of 90 or above, may be recommended by the Faculty for graduation "with distinction."

STUDENT LIFE

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. It also provides first aid in the event of an emergency.

Medical privileges include: (1) the physical examination of all entering students; (2) three visits by the University physician or surgeon, office or residence (District of Columbia) in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration. All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit does not apply to illness or disability incurred previous to the University semester or prior to payment of tuition fees.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student who has severed his connection with the University is ineligible for medical benefits.

PHYSICAL EXAMINATIONS

All first-year students are required to have a comprehensive physical examination within 10 days of admission to the School of Medicine. The students are informed of significant findings and advised regarding such measures as will tend to help them maintain a high standard of health.

In addition medical students benefit from the complete Tuberculosis Case Finding Program which the School maintains. Under this program all students receive tuberculin tests, X-ray examinations, and such special attention from chest specialists as is necessary to reduce to a minimum the dangers from tuberculosis. Students are immunized against those diseases for which proven prophylaxis exists.

LIVING ACCOMMODATIONS

The University maintains four residence halls. Meals are served at the Student Union.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance (for the fall semester by May first, for the spring semester by January first). Forms for application, together with detailed information, may be obtained from the Director of Activities for Women or the Director of Activities for Men.

Information concerning private rooming and boarding facilities near the University, for women students twenty-one years of age or older and for men students, may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls under the age of twenty-one, who are enrolled for twelve or more semester hours of academic work at the University and who are not living with their parents or relatives, may live outside the dormitory only with the permission and approval of the Director of Activities for Women, and upon receipt of written requests from parents. In no case will permission be granted for such girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Women Students.—The Hattie M. Strong Hall provides single rooms at \$45 a month and double rooms at \$40 a month a person.

The Dolly Madison Hall provides double rooms at \$40 a month a person.

Men Students.—Welling Hall provides double rooms for \$30 a month a person.

The John Quincy Adams Hall provides 69 double rooms each with study alcove and bath. Rooms rent for \$40 a month a person.

HONOR SOCIETIES

Alpha Omega Alpha.—National Honor Medical Society. Members of the Junior and Senior classes meeting the qualifications specified by the constitution of the Society are eligible for election to membership.

William Beaumont Medical Society.—Medical students showing unusual ability are elected by the active members of this society, which was founded to encourage medical writing and research among medical students.

Howard Kane-A. F. A. King Obstetrical Society.—The fifteen students in the third and fourth year classes who maintain the highest grades in their work in obstetrics are eligible for membership.

Smith-Reed-Russell Society.—Students of the third and fourth years who maintain a scholastic average of 88 per cent are eligible for membership.

RECREATION

The nation's capital provides abundant recreational resources, a large number of which are available at little or no cost. There are numerous art galleries, museums, concert halls, theaters, swimming pools, parks, and places of great historic interest. There are, in addition, the usual commercial recreation facilities found in a large city. Social activities are provided by student organizations of the University, the School of Medicine, and University sponsored programs such as intramural sports, concerts, recitals, and dramatic productions. Almost every religious faith is represented in Washington by one or more churches, and much spiritual, educational, social, and recreational activity is conducted by the various church groups. There are many other cultural and educational facilities in Washington to meet almost any possible individual need or preference of a medical student and his family.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

THE UNIVERSITY HOSPITAL

THE UNIVERSITY HOSPITAL

The Medical Staff consists of the following groups: Emeritus, Honorary, University, and Courtesy.

Physicians on the faculty and staff of instruction of the School of Medicine are eligible for appointments to the University Hospital Staff. The Administrator of the Hospital and the Director of Nursing are ex-officio members.

OFFICE OF THE MEDICAL DIRECTOR

John Parks, M.D., *Medical Director*
 Alvin Edward Parrish, M.D., *Co-ordinator of Clinical Activities*
 Alfred Brigulio, M.D., *Secretary of the Medical Staff*
 Laura Beasley Brown, *Secretary, Office of the Medical Director*

DEPARTMENTS AND SECTIONS

Department of Anesthesiology: Charles Seymour Coakley, M.D., *Chief*
 Department of Medicine: Thomas McPherson Brown, M.D., *Chief*
 Section of Allergy: Halla Brown, M.D., *Chairman*
 Section of Cardiology: John McCallum Evans, M.D., *Chairman*
 Section of Dermatology: Harry Ford Anderson, M.D., *Chairman*
 Section of Gastroenterology: Thomas Stone Sappington, M.D., *Chairman*
 Section of Infectious Diseases: Monroe James Romansky, M.D., *Chairman*
 Section of Internal Medicine: Charles Robert Lee Halley, M.D., *Chairman*
 Section of Metabolic Diseases: Louis Katz Alpert, M.D., *Chairman*
 Section of Pulmonary Diseases: James Joseph Feffer, M.D., *Chairman*
 Department of Neurology and Neurological Surgery: James Winston Watts, M.D., *Chief*
 Department of Obstetrics and Gynecology: Robert Henry Barter, M.D., *Chief*
 Department of Ophthalmology: Ronald Amore Cox, M.D., *Chief*
 Department of Pathology and Clinical Pathology: Thomas Martin Peery, M.D., *Chief*
 Department of Pediatrics: William Allen Howard, M.D., *Chief*
 Department of Physical Medicine and Rehabilitation: Charles Samuel Wise, M.D., *Chief*
 Department of Psychiatry: Leon Yochelson, M.D., *Chief*
 Department of Radiology: William Woodrow Stanbro, M.D., *Chief*
 Department of Surgery: Brian Blades, M.D., *Chief*
 Section of General Surgery: Brian Blades, M.D., *Chairman*
 Section of Oral Surgery: Karl Hayden Wood, M.D., *Chairman*
 Section of Orthopedics: John Petch Adams, M.D., *Chairman*
 Section of Otorhinolaryngology: James Jerry McFarland, Jr., M.D., *Chairman*
 Section of Plastic Surgery: Gordon Sparks Letterman, M.D., *Chairman*
 Section of Urology: Leon Richard Culbertson, M.D., *Chairman*
 Electroencephalographic Laboratory: Harold Stevens, Ph.D., M.D., *Director*
 Heart Station: John McCallum Evans, M.D., *Director*
 Outpatient Department: Clarence Richard Hartman, M.D., *Director*
 Cancer Clinic: Calvin Trexler Klopp, M.D., *Director*
 Cytology Laboratory: Lois Irene Platt, M.D., *Director*
 Nursing: Margaret Emanuel, R.N., M.S., *Director*

COMMITTEES OF THE MEDICAL STAFF

EXECUTIVE COMMITTEE

John Parks, *Chairman*

R. H. Barter, Brian Blades, Alfred Brigulio, T. M. Brown, C. S. Coakley, R. A. Cox,
Margaret Emanuel, C. R. Hartman, W. A. Howard, V. F. Ludewig, A. E. Par-
rish, T. M. Peery, William Stanbro, J. W. Watta, C. S. Wise, L. T. Yochelson

JOINT CONFERENCE COMMITTEE

Brian Blades, T. M. Brown, W. A. Howard, V. F. Ludewig, John Parks

MEDICAL RECORDS COMMITTEE

P. C. Adkins, *Chairman*Madeline Brown, S. W. Bush, F. P. Ferraraccio, J. W. Sites, *Chief Residents*

INTERN AND RESIDENT COMMITTEE

V. F. Ludewig, *Chairman*

P. C. Adkins, R. H. Barter, J. M. Evans, T. M. Peery

TISSUE COMMITTEE

W. S. McCune, *Chairman*

R. H. Barter, William Newman

CANCER COMMITTEE

C. T. Klopp, *Chairman*

R. H. Barter, Brian Blades, T. M. Brown, V. F. Ludewig, T. M. Peery, William
Stanbro

PHARMACY COMMITTEE

W. R. Felts, *Chairman*

L. K. Alpert, F. D. Cooper, J. A. Dusbabek, J. M. Evans, C. R. Hartman, Louise
O'Neal, J. R. Thistlethwaite

NURSING SERVICE COMMITTEE

Margaret Emanuel, *Chairman*

R. H. Barter, Brian Blades, T. M. Brown, V. F. Ludewig, A. E. Parrish, J. E. Rankin

UNIVERSITY HOSPITAL ADMINISTRATIVE STAFF

OFFICE OF THE ADMINISTRATOR

Victor Frederick Ludewig, B.S., *Administrator*
Fred Augustus Menk, *Associate Administrator*
Francisco Paolo Ferraraccio, B.S., *Assistant Administrator*
Raymond Francis Whitehair, *Administrative Assistant*
Margaret Rice, *Secretary, Office of the Administrator*
Sadie Estelle Oakley, *Chief, Admission Office*
Henry Paul Bunting, B.S., *Assistant Comptroller*
Robert Hamilton Thompson, B.S., *Director of Food Service*

Joanne Louise Styer, B.S., *Chief Therapeutic Dietitian*
Charles Clark Hayes, *Executive Housekeeper*
Frank Leonard Sasher, *Manager, Laundry Department*
Madeline Lenora Brown, R.R.L., A.B., *Medical Record Librarian*
Margaret Emanuel, R.N., M.S., *Director of Nursing*
Louise O'Neal, R.N., A.B., *Assistant Director of Nursing*
Laurence Erwin Johnson, A.M., *Administrative Assistant, Outpatient Department*
Franklin Dero Cooper, M.S., *Chief Pharmacist*
Thelma Moore, *Chief Telephone Operator*

THE GEORGE WASHINGTON UNIVERSITY HOSPITAL

The George Washington University Hospital, with a capacity of 425 beds, is a modern teaching facility for students of the School of Medicine and House Staff. Annual admissions number approximately 17,000; clinic visits are about 40,000 a year. The University Hospital is on Pennsylvania Avenue at Washington Circle. It is fully approved by the American Medical Association, the American Hospital Association, the American College of Surgeons, and the Joint Commission for the Accreditation of Hospitals.

The Council on Medical Education and Hospitals of the American Medical Association and the various specialty boards have approved the University Hospital for residency training in anesthesiology, cardiac disease, internal medicine, neurology, neurological surgery, obstetrics-gynecology, pathology, physical medicine and rehabilitation, plastic surgery, psychiatry, radiology, surgery, and thoracic surgery. In addition, it has mixed internships majoring in medicine, pathology, and surgery.

Junior and senior students of the School of Medicine are assigned to the University Hospital as clinical clerks and in the outpatient department. Regular conferences for students, house staff, and attending physicians are held.

The George Washington University Cancer Clinic, housed in the nearby Helen L. and Mary E. Warwick Memorial Building is part of the University Hospital clinical facilities. Cancer detection and chemotherapeutic and follow-up care, including a supervised home-care program, are among the activities of the Clinic. Approximately 2,500 new patients are seen in the Cancer Clinic each year. Excellent research laboratories form an important part of this facility. The Clinic has been approved by the American College of Surgeons.

Other major teaching activities include a residency program in hospital administration; close affiliation with the University's graduate program in hospital administration; programs in Medical Technology leading to the Bachelor of Science degree as well as to a certificate; and an affiliation for the training of practical nurses.

The Hospital has an excellent branch medical library. The House Staff can also arrange to use libraries of the School of Medicine and the University and the outstanding city and federal libraries and record collections.

INTERN AND RESIDENT TRAINING PROGRAMS

The University Hospital offers mixed-type internships as classified by the National Intern Matching Program, Inc. Twenty-seven internships of one year each are offered; fourteen in the Department of Medicine, eleven in the Department of Surgery, and two in the Department of Pathology.

Mixed Internships, Medicine Major.—Interns are assigned to six months of general medicine, two months on the surgical service, and one month each on neuro-psychiatry, pediatrics, obstetrics and gynecology and the emergency room. One month of the training in medicine and one month in pediatrics are at the District of Columbia General Hospital.

Mixed Internships, Surgery Major.—Interns are assigned to the surgical services for nine months, to general medicine for two months, and to obstetrics for one month.

Mixed Internships, Pathology Major.—Interns are assigned to the pathology service for six months, to general medicine for two months, to surgery for two months, to pediatrics for one month, and to obstetrics for one month.

Fifty-five approved residencies are offered in anesthesiology, cardiac diseases, internal medicine, neurologic surgery, neurology, obstetrics-gynecology, pathology, pediatrics, physical medicine, plastic surgery, psychiatry, roentgenology, surgery, and thoracic surgery. Residency programs are from one to four years in duration depending upon the service. Residents in the University Hospital also receive appointments as members of the Faculty of the School of Medicine with active teaching responsibilities.

Fellowships of one or two years are available in anesthesiology, cardiology, chest diseases, infectious diseases, outpatient service, physical medicine, rheumatic diseases, surgery, and thoracic surgery.

All appointments are for one year with the privilege of applying for continuation on the House Staff. In several of the intern, residency, and fellowship programs, excellent affiliations are maintained with local and governmental hospitals. Inquiries and applications for membership on the House Staff should be addressed to the Chief of the Department concerned or to the Medical Director of The George Washington University Hospital, 901 23d Street NW., Washington 7, D. C.

MEDICAL TECHNOLOGY COURSE

This course is open to candidates for the degree of Bachelor of Science in Medical Technology, offered by Columbian College, and to other applicants meeting the requirements of the Registry of Medical Technologists of the American Society of Clinical Pathologists. These requirements, fully satisfied by the Columbian College program, are as follows: two years (60 semester hours or 90 quarter hours) of college work in any college or university accredited by a recognized standardizing association, including courses in the biological sciences and in chemistry. The requirement (Effective January 1, 1962, the minimum requirements will be increased to three years of college, 90 semester hours or 135 quarter hours. Specific science requirements as given hereafter remain the same) in the biological sciences is satisfied by college courses totaling 12 semester hours (18 quarter hours) in general biology, general microbiology, parasitology, anatomy, histology, embryology, physiology, or zoology; general microbiology is especially recommended. The requirement in chemistry is met by a full year's college course in inorganic chemistry (at least 6 semester hours or 9 quarter hours) plus 3 semester hours in either quantitative analysis, organic chemistry, or biochemistry; quantitative analysis is especially recommended.

In the case of students enrolled in Columbian College for the degree of Bachelor of Science in Medical Technology, the course here described is to be considered

as the final (fourth) year of qualification for the degree. In the case of those who have taken their prerequisite work in some other college or university, satisfactory completion of the Medical Technology Course will not satisfy the requirements for the degree from Columbian College.

The Medical Technology Course consists of 12 months of didactic and practical work in clinical laboratory procedures, offered by the Department of Pathology in the University Hospital. Students ordinarily begin this course with the fall semester, but under exceptional circumstances may begin at other times.

A limited number of scholarships are provided by the University Hospital for students enrolled in the fourth year of the degree program. (See page 00.) All students in this fourth year must provide themselves with uniforms; laundry of uniforms is provided by the University Hospital. A cash allowance of \$65 a month is granted during the last 6 months of the fourth year in training.

Upon satisfactory completion of the course a certificate is awarded and the candidate is eligible for the national certifying examination given by the Registry of Medical Technologists.

Enrollment in the Medical Technology Course is strictly limited so that personal instruction can be given. Acceptance to the Columbian College degree program does not necessarily assure acceptance into the Hospital program. Inquiry about this course should be sent directly to the Department of Pathology, The George Washington University Hospital, Washington 7, D. C.

COURSES OF INSTRUCTION

COURSES OF INSTRUCTION

On the following pages of this BULLETIN, are listed the courses of instruction offered by the School of Medicine. The School of Medicine serves other divisions of the University by making available to nonmedical students certain undergraduate and graduate courses in the following fields: Anatomy, Bacteriology, Biochemistry, Pathology, Pharmacology, Physical Medicine, and Physiology. The courses listed are subject to some slight change. The University reserves the right to withdraw any course announced.

EXPLANATION OF COURSE NUMBERS AND SYMBOLS

A number in parenthesis after the name of a course indicates number of semester hours of credit which may be earned by nonmedical students.

First-year courses are numbered from 101 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and fourth-year courses, from 401 to 500.

Courses offered in the School of Medicine for nonmedical students.—Courses numbered from 101-200 are planned for upper-division students in undergraduate curricula. They may be credited toward high degrees only when registration for graduate credit has been approved at the beginning of the course by the dean responsible for the graduate work and by the officer of instruction, and when the completion of additional work has been certified by the officer of instruction. Courses numbered from 201 to 500 are planned for graduate students.

ANATOMY*

Professors I. R. Telford (*Executive Officer*), Paul Calabrisi
Professional Lecturer T. D. Stewart
Associate Professors F. D. Allan, T. N. Johnson
Assistant Professor J. B. Christensen
Clinical Instructors R. N. Brown, L. E. Church, L. C. Dearden
Fellows J. B. Thomas, N. A. Walensky

Special Lecturers W. E. Haymaker, J. V. Michalski

101.2 Gross Anatomy

Academic year: fall—12 hours a week; spring—8½ hours a week. Regional dissection of the human body, supplemented with lectures and quiz sections. Study of X-ray anatomy to emphasize the functional aspects of the position, shape, and relation of the viscera and skeletal components.

Calabrisi and Staff

103 Human Embryology

Fall—3 hours a week. The origin and development of the human body. Special emphasis on the value of embryology in interpreting anatomical anomalies and variations as seen in gross dissection, surgery, obstetrics, and pathology.

Allan and Staff

*The Staff of Instruction here listed is for the academic year 1960-61.

- 104 Neuroanatomy** Johnson and Staff
Spring—5½ hours a week. The macroscopic and microscopic study of the central nervous system and the special sense organs. Emphasis on such dynamic aspects as development, pathway, lesions, etc.
- 105 Microscopic Anatomy** Telford and Staff
Fall—9 hours a week. Study of the detailed minute structure of cells, tissues, and organs of the human body, with emphasis on the relation of structure to function. Recognition and interpretation of histological sections tested by practical examinations.
- 106 Living Anatomy** The Staff
Spring—1 hour a week. An introduction to physical diagnosis, with special emphasis on topographical anatomy.
- 201-2 Gross Anatomy (6-4)** Calabrisi and Staff
Academic year—as arranged. For qualified nonmedical graduate students. Same as Anatomy 101-2. Anatomy 201—laboratory fee, \$21; Anatomy 202—laboratory fee, \$16.
- 203 Human Embryology (2)** Allan and Staff
Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 103. Laboratory fee, \$8.
- 204 Neuroanatomy (3)** Johnson and Staff
Spring—as arranged. For qualified nonmedical graduate students. Same as Anatomy 104. Laboratory fee, \$13.
- 205 Microscopic Anatomy (4)** Telford and Staff
Fall—as arranged. For qualified nonmedical graduate students. Same as Anatomy 105. Laboratory fee, \$13.
- 221-22 Seminar (1-1)** Allan and Staff
Academic year: 1 hour a week—as arranged. Research or reports and discussions of special topics by the Staff and graduate students. For graduate students. Medical students are encouraged to attend.
- 249-50 Introduction to Medical Research† (3-3)** The Staff
Academic year—Wed., 1:00 to 6:00 p.m. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.
- 295-96 Research (arr.)** The Staff
Academic year—as arranged. Fee to be arranged.
- 299-300 Thesis (3-3)** The Staff

ANESTHESIOLOGY†

Professor C. S. Coakley (Executive Officer)

Clinical Professor D. H. Stubbs

Associate Professor Seymour Alpert

Assistant Professor C. R. MacCordy, Paula Kaiser

Assistant Clinical Professor S. N. Albert

Instructors Maria Benzinger, H. E. Curtis

Clinical Instructors W. E. Bageant, Allen Widome, Charles Gruenwald, Helene Werner

* This is an interdepartmental course. The student should register in the department directing his research.

† The Staff of Instruction here listed is for the academic year 1960-61.

Fellows Ramon Garcia, Marie-Louise Levy

Assistants Maureen Huse, Arthur Peschin, Hugo Quintanilla, Patricia Russell, Catherine Smith, D. C. Smith, Lynn Winchester, W. T. Wong

320 Anesthesiology

The Staff

Spring—1 hour a week. The fundamentals of anesthesia are reviewed and correlated with other medical specialties.

421-22 Anesthesia Seminar

The Staff

Academic year—1 hour a week. Students attend anesthesia seminars during their surgical clinical clerkships. University Hospital.

433-34 Advanced Anesthesiology

The Staff

Academic year—as arranged. Students are rotated through the work of the department for a period of two weeks and assigned to work in the operating rooms and to attend conferences and seminars. For the more advanced students a three-week elective is offered.

BIOCHEMISTRY*

Professors J. H. Roe (*Emeritus*), C. R. Treadwell (*Executive Officer*)

Professorial Lecturers W. R. Carroll, G. G. Ashwell, Irving Gray

Associate Professor B. W. Smith

Associate Professorial Lecturer Leon Swell

Assistant Professors G. V. Vahouny, J. M. Bailey

Associate H. W. Clark, Jr.

Fellows R. R. Gray, R. M. Mayer, S. I. Sherr

113-14 Biochemistry

The Staff

Academic year: lecture (2 hours), conference (1 hour), laboratory (6 hours)—as arranged. Physiologic and clinical chemistry. For medical students.

221-22 Biochemistry (4-4)

Vahouny

Academic year—Tues. and Thurs., 9:00 to 12:00 A.M. and 1:00 to 2:00 P.M. A lecture and laboratory course for nonmedical students. Prerequisite: Chemistry 22 and 152. Material fee, \$15 a semester.

224 Biochemistry of the Enzymes (1)

Ashwell

Spring—Mon., 5:00 P.M. Lecture course dealing with the biochemistry of the enzymes and enzyme reactions. Prerequisite: Biochemistry 113 or 221.

225-26 Biochemical Procedures (3-3)

Smith and Staff

Academic year—as arranged. A laboratory course. Material fee, \$16 a semester.

227-28 Biochemistry Seminar (1-1)

The Staff

Academic year—Fri., 4:00 P.M. The current literature in the field of biochemistry, mainly for graduate students, but open to a limited number of specially qualified medical students.

232 Proteins and Amino Acids (1)

Carroll

Spring—Wed., 5:00 P.M. A lecture course. Prerequisite: Biochemistry 113 or 221.

241 Isotopes (2)

Gray

Fall—Sat., 8:00 A.M. Theoretical characterization of isotopes and their applications in biology. Attention will be given to counting, health physics and radiation safety, autoradiography and chromatography.

* The Staff of Instruction here listed is for the academic year 1960-61.

249-50 Introduction to Medical Research* (3-3)

The Staff

Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

251 Carbohydrate Metabolism (1)

Roe

1962-63 and alternate years: Fall—Sat., 9:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.

261 Biochemistry of the Lipids (1)

Swell, Treadwell

Fall—Sat., 12:00 A.M. A lecture course. Prerequisite: Biochemistry 114 or 222.

295-96 Research in Biochemistry (arr.)

The Staff

Academic year—as arranged.

299-300 Thesis (3-3)

The Staff

DERMATOLOGY AND SYPHILOLOGY†

Professor H. F. Anderson (Executive Officer)

Assistant Clinical Professors Hayden Kirby-Smith, J. Q. Gant, Jr.

Associates W. M. Willett, Reuben Goodman, C. S. Brown

Clinical Instructors Manuel Landman, W. G. Ballinger

214 Dermatology and Syphilology

The Staff

Spring—1 hour a week. Lectures on diseases of the skin and syphilis.

317-18 Clinic

The Staff

Case demonstrations, diagnosis, and treatment of skin diseases and syphilis. General Hospital. D. C.

407-8 ClinicThe Staff
Dermatology

Two hours a week as arranged in rotation during academic year and syphilology in infants and children. Children's Hospital.

409-10 ClinicThe Staff
Clinical dem-

Two hours a week as arranged in rotation during academic year. onstrations, diseases of the skin, University Hospital.

MEDICINE†

Professors T. M. Brown (Executive Officer), M. J. Romansky, L. K. Alpert, J. M. Evans

Clinical Professors C. R. L. Halley, C. B. Ethridge

Associate Professors A. E. Parrish, C. R. Hartman

Associate Clinical Professors Pearl Holly, J. J. Feffer, A. G. Prandoni, Halla Brown, O. R. Farley, D. C. Sun

Assistant Professors S. W. Bush, W. R. Felts, Jr., G. A. Kelser, Jr., M. H. Jacobson, H. H. Orvis, Irene Siu, R. C. Fowler

Assistant Clinical Professors J. A. Reed, T. J. Abernethy, Benjamin Manchester, L. G. Lederer, J. E. Smith, J. W. Trenis, L. E. Putnam, Elizabeth Hill, J. E.

* This is an interdepartmental course. The student should register in the department directing his research.

† The Staff of Instruction here listed is for the academic year 1960-61.

- Rall, B. H. Sullivan, Jr., L. J. Thomas, M. H. Stolar, Alfred Brigulio, T. S. Sappington, S. J. N. Sugar, Joseph Ney, Joseph Beinstein, F. S. Bacon, H. D. Ecker, J. J. Rheingold, Irene Tamagna, J. W. Latimer, Jr., C. W. Jones, C. W. Thompson, E. S. Gladsden, Maurice Mensch, Arthur Rosenbaum, F. J. Murray, E. P. Parker III, M. H. Rosenberg, J. W. DuChez, W. O. Bailey, Jr., Milton Gusack, Jack Kleh, T. A. Gonder, Rashid Massumi
- Associates* Maurice Protas, R. B. Castell, S. T. Gibson, R. B. Miller, Ernest Cotlove, T. J. Kennedy, Jr., Jack Orloff, J. B. Marbury, Louis Ross, F. D. Chapman, L. H. Snyder, R. G. Taylor, J. W. Long, Irvin Kerlan, Virginia Beelar, L. S. Blumenthal, S. W. Kirstein, J. F. Ambury, R. N. Coale, Israel Kessler, W. D. Brill, Marvin Fuchs, W. J. Weaver, Jr., Ruth Benedict, H. M. Silver, J. T. Burns, T. L. Hartman, Boris Rabkin, M. H. Rose, C. A. Schulman, L. A. Craig, Jr., A. W. Danish, Adolph Friedman, Alvin Seltzer, S. D. Loube, Alfred Baer, Herbert Abramson, H. K. Beye, J. H. Pert, John Walsh, C. E. Law, E. L. Rea, J. P. Mann, Conrad Gossels, J. E. Chapman, H. O. Mott, Bertle Nelson, W. K. Billingsley, Jr., H. E. Ticktin, W. J. Schewe, J. H. Watson, N. H. Rubenstein, D. M. Watkin, Edward Adelson, G. J. Fisher, W. L. Stone, B. H. Ostrow, C. D. Cooper, R. R. Belton, S. C. Pascoe, W. R. Ehrmantraut
- Clinical Instructors* E. H. Bauersfeld, H. C. Bates, Jr., Jeanne Bateman, George Sharpe, William Lewis, M. A. Sislen, C. J. Savarese, Jr., B. R. Cooperman, M. G. Sherer, Jacob Robbins, J. C. Mandes, R. L. Howard, Walter Kurland, E. J. Leonard, R. S. Gordon, Jr., Jack Crowell, D. S. Davis, J. W. Roark, J. H. Epstein, G. C. Buchanan, Montague Lane, F. K. Harris II, Audry Connor, H. I. Passes, G. W. Foulke, Margaret McCabe, A. A. Lear, C. H. Levine, O. W. Donnelly, R. F. Dyer, R. S. Poole, P. R. Vagelos, A. D. Merritt, H. C. Sadin, S. J. Talpers, G. I. Shugoll, G. T. Economos, Irwin Ardam, S. W. Dejter, Victor Schocken
- Fellows* E. F. Bittar, T. A. Duncan, J. C. Kirby, Jr., Kai-Bor Lam, H. A. Miller, Jr., W. F. Morrissey, Vincent Pateras, I. C. Schattan, Andree Thomas, Mary Watt
- Assistants* B. L. Albert, P. J. Carpentier, L. H. Fenton, J. D. Foulke, E. P. Grahm, J. A. Jimenez Guervara, M. A. Herman, N. C. Kramer, Frederick Meyers, Hugh Miller, Frederick Moomau, R. A. Olsson, R. I. Ottenberg, F. A. Peck, A. L. Pinkerson, W. P. Reed, W. D. Robinson, Paul Schlein, Joanne Taubman, E. W. Walters, N. A. Wine

Special Lecturers A. D. Kistin, W. K. Myers, Sol Katz, R. W. Berliner, Henry Field, Jr., T. H. McGavack, P. D. Comanduras, W. L. Nalls, Roy Hertz, Albert Sjoerdsma, W. H. Crosby, D. S. Frederickson

- 106 *Living Anatomy* The Staff
 Spring—1 hour a week. An introduction to physical diagnosis, with special emphasis on topographical anatomy.
- 236 *Clinical Microscopy* The Staff
 Spring—3 hours a week. Conferences and studies in the clinical application of laboratory examinations of blood, body fluids, exudates, excreta.
- 242 *Physical Diagnosis* The Staff
 Spring—6 hours a week. Covers not only theoretical but practical application of principles of physical diagnosis as related to examination of patients.
- 243-44 *Introduction to Medicine* The Staff
 Academic year—2 hours a week. Lectures covering the principles of internal medicine preparatory to clinical studies and training in the inpatient and outpatient services.

325-26 Clinical Clerkship

Eight weeks as arranged during academic year. Training with bed patients under individual instruction designed to develop ability in examination of patients and case taking as well as practice in clinical microscopy. D. C. General Hospital.

The Staff

327 Clinical Pathological Conferences I

Fall—1 hour a week. Conferences are held at the School of Medicine. Case histories are presented and discussed by the students and members of the Staff. Clinical, laboratory, and necropsy findings are compared.

The Staff

339-40 Therapeutic Conferences

Academic year—1 hour a week. Conferences designed to emphasize the application of pharmacological principles to the problems of clinical medicine. University Hospital.

Staff of Medicine and Pharmacology

349-50 Medical Conferences

Academic year—2 hours a week. D. C. General Hospital.

The Staff

421-22 Outpatient Clinics

Six weeks as arranged during academic year. Individual case studies under personal supervision of the Staff. Daily clinics on current medical problems and seminars stressing physiological aspects of diseases. Individual examinations and instruction in medical specialties. University Hospital.

The Staff

423-24 Clinical Clerkship

Six weeks as arranged during academic year. University, Mt. Alto, and D. C. General hospitals.

The Staff

427-28 Clinical Pathological Conferences II

Academic year—1 hour a week. Continuation of Medicine 327.

The Staff

429-30 Clinical Pathological Conferences III

Academic year—1 hour a week. Conferences are held at the University Hospital. Attendance is required of students during their medical clerkships there.

The Staff

MICROBIOLOGY AND COMMUNITY HEALTH*

Professors L. W. Parr (*Emeritus*), A. M. Griffin, H. L. Ley, Jr. (*Executive Officer*), Mary Robbins

Clinical Professor R. G. Beachley

Associate Professor Rudolph Hugh

Assistant Professor W. G. McCarten

Clinical Instructor A. H. Traum

Associates W. D. Hann, G. B. Pelleu, Jr.

Special Lecturers S. J. Ajl, L. S. Baron, R. C. Cook, C. W. Emmons, J. L. Goddard, F. B. Gordon, Murray Grant, Leon Jacobs, M. C. Leikind, J. D. McLennon, H. J. Magnuson, W. J. Peeples, G. O. Pierce

101 Biostatistics (1)

Fall—Sat., 11:00 A.M. The meaning and use of statistical terms and methods pertinent to the design of experiments and the interpretation of the results obtained in laboratory, clinical, and field trials.

Griffin

112 General Microbiology (4)

Spring—Mon., Wed., and Fri., 9:10 to 12:00 A.M. For nonmedical students. A study of the fundamentals of bacteriology, including hygienic applications.

Hugh

* The Staff of Instruction here listed is for the academic year 1960-61.

Methods of cultivation and control of several groups of microorganisms are studied in the laboratory. Prerequisite: any biological laboratory science; Chemistry 11-12. Laboratory fee, \$13.

209 Medical Microbiology (1 to 11)

Ley and Staff

Fall: lecture (4 hours), laboratory (10 hours)—as arranged. Bacteria, rickettsia, viruses, yeasts, molds, protozoa, and metazoa which relate to the health and diseases of man—cultural study of most important forms; methods of diagnosis by microscopic, cultural, immunologic, and animal reactions; theory and methods of immunology; vaccines; serums; antibiotics. Open to suitably prepared graduate students; may be elected as a whole or in part by adding the appropriate letter to the course number, with credit allocated as follows: (a) *Bacteriology*, including rickettsia and viruses—lecture (4), laboratory (3); (b) *Parasitology*, including medical mycology—lecture (2), laboratory (1); (c) *Immunology* (1). May be taken by a limited number of candidates for Master's degrees. Laboratory fee, \$4.50 for each semester hour of laboratory work.

210 Fundamentals of Epidemiology and Preventive Medicine (2)

Ley and Staff

Spring—Mon., 2:00 to 4:00 P.M. Sources, modes, and implications of infection and injury. Consideration also given the problem of accidents and industrial medicine. Open to liberal arts graduate students. Prerequisite: Bacteriology 112 to 209.

219-20 Advanced Microbiology (arr.)

Hugh and Staff

Academic year—as arranged. Special study of advanced methods and current problems in microbiology for suitably qualified students specializing in microbiology. Prerequisite: Bacteriology 112 to 209; Chemistry 151-52 or the equivalent; permission of the instructor. Laboratory fee, \$4.50 a semester hour.

210 Fundamentals of Epidemiology and Preventive Medicine (2)

Ley and Staff

Spring—Mon., 2:00 to 4:00 P.M. Sources, modes, and implications of infection and injury. Consideration also given the problem of accidents and industrial medicine. Open to liberal arts graduate students. Prerequisite: Microbiology 112 or 209.

219-20 Advanced Microbiology (arr.)

The Staff

Academic year—as arranged. Special study of advanced methods and current problems in microbiology for suitably qualified students specializing in microbiology. Prerequisite: Microbiology 112 or 209; Chemistry 151-52 or the equivalent; permission of the instructor. Laboratory fee, \$4.50 a semester hour.

230 Statistics in Microbiology (3)

Griffin

Spring—as arranged. The application of statistical methods to the problems of microbiology. For graduate students. Prerequisite: elementary college algebra.

232 Immunological Methods (3)

McCarten

1962-63 and alternate years: spring—as arranged. Preparation and testing of serological materials. Demonstration of basic serological phenomena. For graduate students. Prerequisite: Microbiology 112 or 209 and permission of the instructor. Laboratory fee, \$11.

234 Virology (6)

Robbins

1961-62 and alternate years: spring—as arranged. Study of viruses and rickettsiae. Lectures and laboratory exercises. For graduate students. Prerequisite: Microbiology 112 or 209 and permission of the instructor. Laboratory fee, \$16.

240 Advanced Epidemiology and Public Health (3)

Ley

Spring—as arranged. Conferences, readings, and problems for graduate students dealing with specialized and advanced phases of the topics presented in Microbiology 210. Prerequisite: Microbiology 210.

249-50 Introduction to Medical Research* (3-3)

The Staff

Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

293-94 Staff Seminar (1-1)

The Staff

Academic year—as arranged. For graduate students. Bi-weekly throughout the year.

295-96 Research in Microbiology (arr.)

The Staff

Academic year—as arranged.

299-300 Thesis (3-3)

The Staff

401 Public Health Practice

Beachley and Staff

Fall—1 hour a week for 5 weeks. Study of public health practice at national, state, city, and county levels. Public and private agencies.

NEUROLOGY AND NEUROLOGICAL SURGERY†

Professors J. W. Watts (*Executive Officer*), Harold Stevens

Clinical Professor H. D. Shapiro

Associate Clinical Professors R. H. Groh, J. M. Williams

Assistant Clinical Professors J. P. Murphy, H. V. Rizzoli, A. S. Dekaban, Paul Chodoff

Associates G. D. Weickhardt, Harvey Ammerman, G. J. Hayes, C. A. Maran

Clinical Instructors M. C. Korengold, J. T. Lord, N. H. Horwitz, Z. W. Sanders, Ninos Myrianthopoulos, R. H. Robertson, R. A. Mendelsohn, Ruth Jakoby, Virginia Duggins

Fellow J. W. Barrett

Assistants J. L. Fox, Karin Nelson

Special Lecturer S. S. Kety

249 Neurology: Basic

Stevens, Williams

Fall—1 hour a week. Methods used to study the form and function of the nervous system. Lectures and laboratory demonstrations.

250 Neurology

Stevens, Shapiro

Spring—1 hour a week. Introductory lectures on clinical neurology with specimens, lantern slides, and motion pictures.

331 Neurology and Neurological Surgery

Watts, Stevens

Fall—1 hour a week. Clinical lectures and demonstrations.

333-34 Neurology and Neurological Surgery, Clinical Clerkship

Stevens, Williams, Ammerman

In conjunction with Neurology 335-36. Two weeks in rotation as arranged during academic year. Instruction in history, physical examination, ordinary clinical procedures. Attendance at neurosurgical operations. Six students in rotation. D. C. General Hospital.

335-36 Neurosurgical Conferences

Watts and Staff

Clinical conferences weekly. Six students in rotation. D. C. General Hospital.

* This is an interdepartmental course. The student should register in the department directing his research.

† The Staff of Instruction here listed is for the academic year 1960-61.

- 431-32 Neurology and Neurological Surgery Clinic** Shapiro, Rizzoli
Two hours a week for three weeks in rotation as arranged during academic year. Neurological outpatient clinic. Consultation of staff on ambulatory cases, demonstration of diagnostic procedures. Six students in rotation. University Hospital.
- 433-34 Clinical Neurology** Groh, Sanders
Two hours a week for three weeks in rotation as arranged during academic year. Neurological inpatient examinations and demonstrations. Six students in rotation. St. Elizabeths Hospital.
- 435-36 Neurological Surgery (elective)** The Staff
Academic year—bi-monthly. Lectures and motion picture demonstration of neuro-surgical problems.

OBSTETRICS AND GYNECOLOGY*

- Professors* John Parks, R. H. Barter (*Executive Officer*)
Clinical Professors H. L. Darnier, George Nordlinger
Associate Clinical Professor S. M. Dodek
Assistant Professors J. G. Sites, W. P. McKelway
Assistant Clinical Professors J. K. Cromer, J. A. Dusbabek, C. K. Fraser, Caroline Jackson
Associates B. W. Richwine, F. S. Rogers, R. M. Roll, W. T. Lady, J. W. Pearson, Jr., T. M. Leonard, Shirley Martin, N. J. Price, T. A. Wilson
Clinical Instructors J. R. Epstein, M. S. Kaufman, S. H. Shea, A. S. Bright, R. E. Bieren, M. P. Footer, Donald Walters, J. M. Friedman, L. M. Liverett, W. H. Cooper, Peter Soyster, H. P. Treichler, J. C. Walsh, I. W. Rovner, M. W. Sandmeyer, Jr., N. M. Tart, Elizabeth Crisp, L. W. Davis
Assistants R. J. Abaunza, S. M. Belinsky, T. F. Blackwelder, R. V. Erkenbeck, Tracy Kobs, J. R. Marshall, H. E. Olson, C. M. Tyndal
- 254 Introduction to Obstetrics and Gynecology** Dodek, Fraser
Spring—1 hour a week. Lectures and demonstrations on the development and physiology of the female reproductive system and the management of normal pregnancy.

- 301-2 Manikin Demonstrations** Footer, Friedman
One hour a week for eight weeks in rotation as arranged during academic year. The mechanism of labor and various types of operative delivery demonstrated to sections of the junior class. D. C. General Hospital.

- 337-38 Obstetrics and Gynecology** Parks, Barter, Sites, McKelway
Academic year—2 hours a week. Lectures and demonstrations on the principles of obstetrics and gynecology.

- 351-52 Clinical Clerkship** The Staff
Four weeks during academic year as arranged. Clerkship with patients, including ward rounds, operating room demonstrations, and weekly clinic. D. C. General Hospital.

- 439-40 Clinic in Obstetrics and Gynecology** Barter, Sites, McKelway
Two hours a week for eight weeks in rotation as arranged during academic year. Student presentation and discussion of patient problems. Demonstration of equipment used in obstetric and gynecologic practice.

* The Staff of Instruction here listed is for the academic year 1960-61.

441-42 Clinical Obstetrics**The Staff**

Academic year—as arranged. Students participate in prenatal and postnatal clinic care, observe the course of labor and deliver patients under supervision, attend bi-weekly departmental conferences and daily ward rounds in the University and D. C. General hospitals.

443-44 Clinical Gynecology**The Staff**

Eight weeks in rotation as arranged during academic year. Students observe and participate in the gynecological clinics and operating rooms of the University and D. C. General hospitals.

OPHTHALMOLOGY*

Professor R. A. Cox (Executive Officer)

Clinical Professor E. A. W. Sheppard

Assistant Clinical Professor R. W. Wilkinson

Associates W. J. Romejko, W. P. Chalfant, Jr., W. J. G. Davis, R. E. duPrey, Robert Day, M. G. Alper

Clinical Instructors J. H. Lodge, W. B. Glew, J. W. McTigue, J. R. Weimer

352 Ophthalmology**The Staff**

Spring—one hour a week for sixteen weeks as arranged. Lecture course presenting aspects of all the principles of ophthalmology.

447-48 Clinic**The Staff**

Academic year—as arranged. Each student is given individual instruction in ophthalmological diagnosis.

OTOLARYNGOLOGY*

Associate Clinical Professor J. J. McFarland, Jr. (Executive Officer)

Assistant Clinical Professors Catharine Birch, J. L. Levine

Associates M. E. Krucoff, W. B. Walters, R. S. Page, Jr., J. A. Sabri, W. M. Tribble

351 Otolaryngology**The Staff**

Spring—1 hour a week for fourteen weeks. Lectures and demonstrations on anatomy, physiology, and diseases of the ear, nose, and throat.

354 Bronchoscopy**The Staff**

Spring—1 hour a week for two weeks. A series of lectures on the fundamental principles and the use of instruments, including both the bronchoscope and esophagoscope.

355-56 Clinic**The Staff**

One and one-half hours a week in rotation as arranged during academic year. Practical clinical instruction in the diagnosis and treatment of diseases of the ear, nose, and throat. D. C. General Hospital.

PATHOLOGY*

Professor T. M. Peery (Executive Officer), W. R. Duryee (Research)

Clinical Professor D. L. Weiss

Associate Professors F. N. Miller, Jr., William Newman, W. L. Marsh

Assistant Professor Lois Platt

Assistants Gloria Brennan, Peter Clemente, J. H. Roe, Jr., Erlo Roth, Joan Shapiro

* The Staff of Instruction here listed is for the academic year 1960-61.

SPECIAL STAFF FOR DEMONSTRATIONS

Associate Clinical Professors J. S. Howe, E. F. Geever
Assistant Clinical Professors R. G. Gottschalk, R. E. Palmer, W. F. Enos, Cornelia Hoch-Ligeti
Associates L. E. Zimmerman, L. W. Fix, C. B. Cook
Clinical Instructors C. P. Barnett, D. R. Parkinson

Special Lecturers E. B. Helwig, L. C. Johnson

- 115-16 *Introduction to Medical Science* (1-1) Marsh and Staff
 Academic year—1 hour a week. For students in medical technology at the University Hospital. These lectures, based upon physiology, pathology, and medicine, provide a background for the interpretation of laboratory data.
- 117-18 *Principles in Medical Technology* (4-4) Marsh and Staff
 Academic year—4 hours a week. For students in medical technology at the University Hospital. Theories, principles, and sources of error, of the methods used in clinical chemistry, clinical bacteriology, serology, hematology, and clinical microscopy.
- 119 *Medical Technology Laboratory* (20) Marsh and Staff
 30 hours a week for 50 weeks. Practice and experience by rotation through the various divisions of the Pathology laboratories of the University Hospital, as follows: hematology and urinalysis, 12 weeks; chemistry, 12 weeks; bacteriology and parasitology, 10 weeks; blood bank, 8 weeks; serology, 4 weeks; tissue pathology, 4 weeks.
- 259-60 *Pathology* Peery, Miller
 Fall—9 hours a week; spring—3 hours a week. General pathology of inflammations, degenerations, malformations, and neoplasms. Special pathology of the organs and specific diseases. The laboratory work consists of the gross and microscopic study of diseased tissue. Special emphasis is placed on the interrelationships of the various pathologic changes and their correlation with symptoms and physical signs.
- 261-62 *Necropsy* The Staff
 Academic year—as arranged. Students are required to attend and assist in the performance of necropsies at the University Hospital.
- 263-64 *Demonstrations in Pathology* Special Staff
 Academic year—1 hour a week. Gross specimens from several hospitals are demonstrated and discussed.
- 267-68 *Seminars in Pathology* Special Lectures
 Academic year—as arranged. Advanced lectures are presented as arranged on special topics in pathology.
- 270 *Forensic Pathology and Medical Jurisprudence* Miller
 Spring—1 hour a week. Forensic pathology, toxicology, chemistry, and immunology. The legal and ethical rights and responsibilities of physicians. Legal problems in medicine.
- 323-24 *Surgical Pathology I* Weiss
 Academic year—1 hour a week. Weekly conferences are held with the student group assigned to the surgical clerkship, reviewing current surgical specimens.
- 327 *Clinical Pathological Conferences I* The Staff
 Fall—1 hour a week. Conferences are held at the School of Medicine. Case histories are presented and discussed by the students and members of the Staff. Clinical, laboratory, and necropsy findings are correlated.
- 327-28 *Clinical Pathological Conferences II* The Staff
 Academic year—1 hour a week. Continuation of Pathology 327.

429-30 Clinical Pathological Conferences III

Academic year—1 hour a week. Conferences are held at the University Hospital. Attendance is required of students during the medical clerkship there. **The Staff**

492 Surgical Pathology II

Spring—1 hour a week. A systematic study of the gross and microscopic changes in the organs and tissues commonly removed surgically. **Newman**

493-94 Pathology Clerkship (elective)

Academic year—as arranged. A limited number of students receive training in surgical pathology and necropsies in the laboratories of the University Hospital. **The Staff**

PEDIATRICS*

Clinical Professors Margaret Nicholson, Edward Lewis, W. S. Anderson, R. H. Parrott, L. E. Hoeck

Associate Clinical Professors J. A. Washington, R. S. Lourie, T. E. Reichelderfer, W. A. Howard (*Executive Officer*)

Assistant Clinical Professors Margaret Gutelius, Mabel Grosvenor, Aaron Nimetz, George Maksim

Associates J. H. Peacock, Jr., M. I. Cohen, Mary Sartwell, A. B. Coleman, C. F. Stiegler, H. G. Clark, Adrian Recinos, Jr., R. E. Martin, C. R. Webb, William Stark, A. R. MacPherson, S. L. Leikin

Clinical Instructors H. H. Diamond, R. H. Mitchell, R. O. Warthen, Emilie Black, R. H. Anderson, W. G. Preisser, Bennett Olshaker, H. T. Yates, Roger Bergstrom, G. J. Cohen, M. S. Glatt, Mary Fox, J. L. Hatleberg, S. Z. Goldblatt, Hilary Millar, Harold Plotsky, A. J. Modlin, J. R. Puig, G. W. Daisley, Jr., Jean Lockhart, M. I. Mones, W. N. Sterling

Assistants F. W. Floyd, Jr., Claire Hammel, J. A. Marchesani

Special Lecturer M. E. Wegman

256 Pediatrics

Spring—2 hours a week. Lectures on physiology of the newborn, normal behavior, emotional and physical development, infant nutrition, diseases of the newborn, common anomalies and system illnesses of infancy and childhood. Medical School. **Howard and Staff**

355-56 Pediatrics

Continuation of 256, with increasing emphasis on pathologic disease states, stressing pathophysiology and treatment. **Howard and Staff**

357-58 Clinical Clerkship: General Pediatrics

Two weeks as arranged during academic year. Introduction to clinical pediatrics. Emphasis on bedside discussion and group seminars including the newborn. Ward rounds. Five students in rotation. D. C. General Hospital. **Reichelderfer and Staff**

359-60 Clinical Clerkship: Contagious Diseases

Two weeks as arranged during academic year. Conferences and bedside discussion on contagious and infectious diseases. Prevention and quarantine measures. Five students in rotation. D. C. General Hospital. **Reichelderfer and Staff**

361-62 Clinical Conferences I

Academic year—1 hour a week. Required. Presentation and discussion by students of current patient problems. D. C. General Hospital. **Reichelderfer and Staff**

*The Staff of Instruction here listed is for the academic year 1960-61.

- 363-64 Ward Rounds** Reichelderfer, Sterling, and Staff
Academic year—as arranged. Bi-weekly ward rounds, with students and Resident Staff. D. C. General Hospital.
- 365-66 Psychiatry** Lourie and Staff
Academic year—as arranged. Lectures on neuroses of children and adolescents (in cooperation with the Department of Psychiatry).
- 457-58 Clinical Clerkship** Howard and Staff
Six weeks as arranged during academic year. Full time, including assignment to night and holiday admissions. Case studies on wards under direct Resident supervision. Ward rounds with Staff and Residents. Twelve students. Children's Hospital.
- 459-60 Outpatient Clinics** Howard and Staff
Academic year—as arranged. Work in Medical and Specialty clinics including surgery, allergy, X-ray, child welfare, cardiology, dermatology, neurology, and child guidance. Children's Hospital.
- 461-62 Clinical Pathological Conferences** Howard and Staff
Academic year—1 hour a week. Clinical and pathological discussion of recent patient history and laboratory data. Medical School.
- 463-64 Teaching Rounds** Gutelius and Staff
Academic year—three times a week. Discussion of clinical problems of diagnosis and treatment of current patients. Children's Hospital.
- 465-66 Section Conferences** The Staff
Academic year—1 hour a week. Surgical diagnosis, pre- and post-operative management. Children's Hospital.
- 467-68 Clinical Conferences II** Howard and Staff
Academic year—1 hour a week. Required. Staff and student discussion of current problems in pediatrics with review of recent literature. Children's Hospital.
- 469-70 Clinical Pediatric Psychiatry** Lourie and Staff
Academic year—as arranged. Clerkship in fourth year including Well Baby Clinic. Group and class conferences.

PHARMACOLOGY*

Professor H. G. Mandel (*Executive Officer*)
 Clinical Professor R. G. Smith
 Professorial Lecturer B. B. Brodie
 Associate Professors Clarke Davison, R. M. Wiedersheim (*Research*)
 Assistant Professors P. B. Danneberg, Ariel Hollinshead (*Research*), George Fiala (*Research*), J. F. Henderson (*Research*), Melvin Reich (*Research*)
 Fellows W. R. Bell, Morton Levitt, A. B. M. Naqiyyullah, R. S. Rozman, W. R. Sterling

Special Lecturer W. V. C. Leahy

- 249-50 Introduction to Medical Research† (3-3)** The Staff
Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical.

* The Staff of Instruction here listed is for the academic year 1960-61.
 † This is an interdepartmental course. The student should register in the department directing his research.

chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

261 Pharmacology (5)

Fall—5 hours a week. Lectures and conferences concerning the interaction of drugs and biological systems as a basis for the rational therapy of disease. Open to qualified nonmedical students. The Staff

262 Chemotherapy (1)

Spring—1 hour a week. Continuation of Pharmacology 261. The Staff

263 Pharmacology Laboratory (1)

Fall—3 hours a week. Laboratory instruction and demonstrations designed to complement Pharmacology 261. Open to qualified nonmedical students. The Staff

267-68 Pharmacological Research (arr.)

Academic year—as arranged. Primarily for those properly qualified graduate and medical students seeking careers in pharmacology. The Staff

269-70 Pharmacology Seminar (1-1)

Academic year—2 hours a week. Recent advances in pharmacology. For those interested in pharmacological research. Open to qualified nonmedical students. The Staff

279-80 Mechanism of Drug Action

Academic year—as arranged. A course to familiarize the student with advanced biochemical, microbiological and physiological methods employed in pharmacological investigations. Open to qualified nonmedical students. The Staff

299-300 Thesis (3-3)

Academic year—as arranged. Required of Master of Arts and Master of Science candidates. The Staff

PHYSICAL MEDICINE AND REHABILITATION*

Professor C. S. Wise (Executive Officer)

Assistant Professor John Watt, Jr.

Associates A. B. C. Knudson, F. L. Wenger

Fellow C. R. Peterson

Assistants Jessie Fair, Kyoko Ishiyama

150 Elements of Physical Medicine

Spring—as arranged. In arrangement with the Anatomy Department, lectures and demonstrations of the various tests and measurements are employed in the evaluation of physical disability. The Staff

352 Advanced Physical Medicine

Spring—1 hour a week. Lectures and demonstrations concerning the various techniques, clinical applications of physical medicine and rehabilitation to be integrated with the teaching of the associated medical and surgical specialties. The Staff

467-68 Clinical Studies (elective)

Academic year—as arranged. Clinical teaching and demonstration at the University Hospital. The Staff

485 Research (arr.)

Fall—as arranged. Open to medical students and qualified nonmedical students. The Staff

* The Staff of Instruction here listed is for the academic year 1960-61.

PHYSIOLOGY*

Professors C. E. Leese, C. A. M. Hogben (*Executive Officer*)
Associate Professors E. M. Renkin,† F. P. J. Diecke
Assistant Professors Ruth McClintock, C. S. Tidball (*Research*), L. P. Sullivan
Lecturers Eugene Braunwald, J. F. Hoffman, D. P. Rall
Associates Saul Winegrad, P. G. Linaweaver, Jr., R. J. Gummit, Margaret Westecker, Mary Tidball, K. A. Hubel, K. W. Kohn, W. C. Mohler, J. H. Mitchell, P. G. Nelson
Fellows Bernell Baldwin, Muniswamappa Basavaraju, Carmia Borek, Elizabeth Stephenson

Special Lecturer S. J. Sarnoff

115 *Physiology* (3) Leese
 Fall: section A—Tues. and Thurs., 8:45 to 10:00 A.M.; section B—Tues. and Thurs., 5:10 to 6:25 P.M. Lectures for nonmedical students covering the fundamentals of physiology in its various subdivisions. Prerequisite: one year of general science or one semester of a biological science. Prerequisites and time subject to change 1960-61.

117 *Experimental Physiology* (1) The Staff
 Fall—Fri., 2:10 to 5:10 P.M. Laboratory exercises in the fundamentals of physiology for nonmedical students. Prerequisite or concurrent registration: Physiology 115; or the equivalent. Material fee, \$18. Prerequisites and time subject to change 1960-61.

120 *Physiology of Endocrine Activity* (2)
 Not offered 1961-62. For nonmedical students. The circulatory, metabolic, reproductive growth, and other adaptations immediate and long term; accompanying and affecting endocrine activity. Prerequisite: Physiology 115 or the equivalent.

130 *The Psycho-physiology of Personality* (2) Leese
 Spring—Tues. and Thurs., 5:10 P.M. For nonmedical students. Lectures on the genesis and expression of personality, with emphasis on the physiological approach. Prerequisite: Physiology 115 or the equivalent and general psychology.

140-50 *Medical Physiology* Hogben and Staff
 Fall—4 hours a week; spring—14 hours a week. Lectures and laboratory work in all divisions of Physiology. This course is designed for medical students.

211-12 *Problems in Physiology* (arr.) Hogben
 Academic year—as arranged. For nonmedical graduate students. Open to undergraduate students with the approval of the Department. Prerequisite: Physiology 115 and 117, or the equivalent.

221-22 *Physiology Seminar* (1-1) The Staff
 Academic year—1 hour a week, as arranged. For nonmedical students undertaking graduate work in physiology. Prerequisite: Physiology 115 and 117, or the equivalent.

231-32 *Advanced Physiology* (6-6) Hogben
 A year course: credit is not given for the first half until the second half is completed. Fall—4 hours a week; spring 14 hours a week, as arranged. For nonmedical graduate students. Lectures and laboratory work in all major areas of physiology. Physiology 232: material fee, \$42.

* The Staff of Instruction here listed is for the academic year 1960-61.
 † On leave of absence 1960-61.

249-50 Introduction to Medical Research* (3-3)

The Staff

Academic year—Wed., 1:00 to 6:00 P.M. Primarily for graduate students. A comprehensive introduction to the major medical research techniques—statistical, physical, chemical, electrical, and radioisotopic—as applied to biological materials in the medical sciences. Laboratory fee, \$7.50 a semester.

269-70 Pharmacologic Physiology (1-1)

The Staff

Academic year—one hour a week, as arranged. Recent advances in physiology and pharmacology for those interested in research. Open to qualified medical and nonmedical students.

279 Topics in Physiology (1)

The Staff

Fall—one hour a week, as arranged. Review of the active areas of research. Open to qualified medical and graduate students. Prerequisite: Physiology 150 or 232.

295-96 Research (arr.)

The Staff

Academic year—as arranged.

299-300 Thesis (3-3)

The Staff

PSYCHIATRY†

Professors Winfred Overholser (*Emeritus*), Leon Yochelson (*Executive Officer*)
Clinical Professors Joel Elkes, J. D. Schultz

Associate Clinical Professors H. P. Laughlin, M. deG. Ruffin, Sidney Berman,
Morris Kleinerman, Elmer Klein, Anna Todd, Norman Taub

Assistant Professor J. E. Rankin

Assistant Clinical Professors Harold Corson, Sarah Tenenblatt, Richard Schaengold,
Leon Ferber, P. H. Gray, David Eden, C. T. Bever, C. E. Goshen

Associates R. M. Greenberg, Helen Pallister, W. C. Johnson, W. D. Kehne, H. A. Meyersburg

Clinical Instructors R. A. Rogers, J. A. Farrell, S. C. Gordon, H. B. Lehrman,
R. A. Frank, Maxwell Boverman, Helen Pearcey, A. M. Drummond, G. W. Sprehn,
N. C. Rintz, Leslie Schaffer, J. L. Sheridan, L. J. Duhl, G. W. Metcalf, S. L. Werkman, D. W. Harris, A. H. Kiracofe, T. M. Mackenzie, B. W. Murphy, Daniel Prager, F. N. Waldrop

Assistants C. A. Bohrer, B. L. Doll

Special Lecturer R. H. Felix

165 Introductory Medical Psychology

Berman

Fall—1 hour a week. An orientation course in the anatomical, physiological, and psychological growth and development of personality. Consideration of characteristics of structure, function, and development of the psyche leading to normal behavior as a basis for the study of the pathological. Evaluation of interpersonal relationships.

178 Psychopathology

Rankin

Spring—1 hour a week. Manifestations and understanding of various mental mechanisms and abnormal reaction-types, preceded by history of development of psychopathology and illustrated with case material.

* This is an interdepartmental course. The student should register in the department directing his research.

† The Staff of Instruction here listed is for the academic year 1960-61.

- 266 *Psychiatry* Yochelson
Spring—1 hour a week. Psychiatry in the practice of Medicine. Techniques of interviewing.
- 268 *Demonstration Clinics* The Staff
Spring—3 hours a week. History, etiology, symptoms, course, and treatment of the major psychoses with emphasis on the dynamics involving the person as a whole. Presentation of clinical cases of major mental illnesses and primary behavior disturbances. Each student examines patients under supervision. St. Elizabeths and D. C. General hospitals.
- 272 *Psychosomatic Aspects of General Medicine* Ruffin
Spring—1 hour a week. Somatic disorders of psychogenic origin. The role of personality reactions in functional and organic disorders.
- 324 *Psychoneurosis* Ferber
Spring—1 hour a week. Etiology, psychopathology, clinical aspects, and treatment of various types of psychoneuroses. Medical Conference Room, D. C. General Hospital.
- 31-32 *Clinical Clerkship* The Staff
Three weeks divided service as arranged during academic year. Supervised examination, diagnosis, and treatment of ambulatory cases in University Hospital and hospitalized cases in St. Elizabeths Hospital. Conferences for discussion of cases. Clinical application of psychiatric principles to general medical practice is stressed. University Hospital Inpatient and Outpatient Psychiatric clinics and St. Elizabeths Hospital.

RADIOLOGY*

- Professor W. W. Stanbro (*Executive Officer*)
Assistant Professor W. W. Saunders
Assistant Clinical Professors Charlotte Donlan, S. R. Bersack, H. J. Kicherer, H. L. Berman, J. A. Isherwood, E. R. King
Associates A. C. Wyman, S. W. Smith
Instructor C. F. Murphy
Clinical Instructors George Tievsky, U. V. Wilcox II, C. M. Weber, Nan Van Wagenen
Assistants Palma Abraham, O. M. Cortes, R. H. Kim, Margaret Mones, M. S. Navabpour, W. J. Nelson
- 115-16 *Anatomy* The Staff
Academic year—as arranged. Correlation of gross and Roentgen anatomy.
- 220 *Principles of Radiology* The Staff
Spring—1 hour a week. Lectures and discussions.
- 313 *Advanced Radiological Diagnosis* The Staff
Fall—as arranged. Lectures and discussions.
- 421-22 *Clinical Studies* The Staff
Students are assigned to the X-ray Department in rotation on a full-time basis for a specific period.

SURGERY*

- Professors Brian Blades (*Executive Officer*), C. T. Klopp
Clinical Professors W. S. McCune, V. M. Iovine, Alec Horwitz, G. A. Higgins, Jr.
Associate Professor P. C. Adkins

* The Staff of Instruction here listed is for the academic year 1960-61.

Associate Clinical Professors J. P. Adams, G. S. Letterman

Assistant Professors H. C. Pierpont, N. P. D. Smyth

Assistant Clinical Professors B. F. Dean, Jr., Carl Berg, J. S. Neviasser, J. B. Harrell, L. T. Peterson, H. L. Feffer, J. R. Thistlethwaite, Thomas Bradley, Murdock Head

Associates W. R. Morris, J. J. Weinstein, W. C. Meloy, K. H. Wood, Isabella Harrison, Maxine Schurter

Instructors T. C. Alford, Jacob Rosenweig

Clinical Instructors C. D. Briggs, J. F. Conlon, D. C. Richtmeyer, Leon Gerber,

E. A. Gould, A. B. Rohraugh, Jr., M. H. Kendrick, B. G. Brown, J. D. Hoyle,

R. R. Smith, N. H. Isaacson, C. S. White, Jr., D. P. McCarty, J. M. Keshishian,

R. L. Dow, L. R. Perna, T. M. Wright, D. C. Wherry, J. H. Sager

Assistants A. G. Abadier, J. J. Bergera, W. J. Cushing, J. I. Masloff, R. B. Mont-

gomery, R. D. Phillips, S. J. Silberman, D. F. Smith, Bahman Teimourian, J. A.

Tolley III, N. T. Tsangaris, G. E. White

101-2 Surgical Anatomy I

Surgery and Anatomy Staffs

Academic year—1 hour alternate weeks, as arranged. Clinics illustrating relationship between gross anatomy and clinical surgery. University Hospital.

284 Surgical Physiology

The Staff

Spring—2 hours a week. A clinical and laboratory course with particular emphasis on applied physiology.

323-24 Surgical Pathology I

Weiss

Academic year—1 hour a week. Weekly conferences are held with the student group assigned to the surgical clerkship, reviewing surgical specimens.

373-74 Clinical Clerkship I

The Staff

Academic year—as arranged. The student is assigned and required to work up thoroughly the cases for diagnosis and treatment. D. C. General Hospital.

375-76 Outpatient Surgical Clinic

The Staff

Forty hours as arranged during academic year. Surgical clinic. D. C. General Hospital.

377 Fractures and Orthopedics

The Staff

Fall—1 hour a week. Lectures covering the field of fractures and orthopedics. D. C. General Hospital.

379-80 Lectures in Surgery

The Staff

Academic year—2 hours a week. D. C. General Hospital.

383-84 Surgical Clinic

Blades

Academic year—1 hour a week. Demonstration of various surgical diseases to the entire class. University Hospital.

473-74 Clinical Clerkship II

The Staff

Academic year—in rotation. Six weeks, University Hospital; three weeks, Mt. Alto Hospital.

479-80 Surgical Staff Conferences

The Staff

Academic year—Wednesday as arranged. University Hospital.

483-84 Surgical Ward Rounds

Blades

Academic year—1 hour a week. Demonstration of various surgical diseases to fourth-year clerks. University Hospital.

491 Surgical Anatomy II

Horwitz and Staff

Fall—1 hour a week for twelve weeks in rotation. Lectures for fourth-year clerks. University Hospital.

492 Surgical Pathology II

Newman

Spring—1 hour a week. A systematic study of the gross and microscopic changes in the organs and tissues commonly removed surgically.

UROLOGY*

Clinical Professor L. R. Culbertson (*Executive Officer*)

Clinical Professor E. E. Ferguson

Assistant Clinical Professors W. D. Jarman, F. T. Reuter

Associates Gilbert Ottenberg, G. R. MacDonald

Clinical Instructors H. D. Wolff, Jr., H. P. Dorman, H. A. Goldberg, W. D. Oldham,
John Kenealy

395-96 Clinic

The Staff

Clinical teaching and demonstrations on the care of urological patients with special emphasis on the pre- and post-operative management. Operative clinics and clinical teaching. D. C. General Hospital.

397 Urology

The Staff

Fall—1 hour a week. Lectures covering the entire field of urology including diagnosis, treatment, and morbid pathology.

495-96 Clinic

The Staff

Three hours a week, in rotation, as arranged during academic year. Clinical demonstrations, teaching in the Outpatient Department, and urological X-ray conferences, with special attention given to diagnostic procedures. University Hospital.

* The Staff of Instruction here listed is for the academic year 1960-61.

THE SCHOOL OF MEDICINE RECORD
1960-61

DEGREES CONFERRED

DOCTOR OF MEDICINE

JUNE 1, 1960

| | | | |
|--|--------|--|----------------|
| Rashid Abdullah Ali Abdu A.B. 1956, Lafayette College | Yemen | Joseph Adolf Evers B.S. in Phar. 1953, University of California | Calif. |
| Beate Ponack Allett (With distinction) | N.J. | Victor Alexander Fazekas Edward Joseph Feroli | D.C. Mass. |
| B.S. 1956, Tufts University | Oreg. | B.S. in Phar. 1955, Massachusetts College of Pharmacy | |
| Richard Hadley Allen, Jr. A.B. 1956, Occidental College | Pa. | Harold Leopold Floyd (With distinction) | Md. |
| Lucille Alberta Anstine B.S. 1956, The George Washington University | | Frank Elwin Gantz, Jr. Allen Stiles Gardner | Md. Md. |
| Helen Constance Bonbrest A.B. 1958, The George Washington University | Md. | B.S. 1956, College of William and Mary | |
| Gerald Thomas Bowen Norman James Bru | Va. | Djamshid Ghatan A.B. 1956, Susquehanna University | Iran |
| A.B. 1956, University of California | Calif. | Louis Frank Glatch, Jr. A.B. 1956, Reed College | Minn. |
| John Richard Bruhn A.B. 1956, Carlton College | Ala. | Julius Morton Goodman (With distinction) | Md. |
| Keith Elwyn Buchanan B.S. 1956, University of Wisconsin | Wis. | A.B. 1958, The George Washington University | |
| Mary Josephine Burgess A.B. 1956, Catholic University of America | N.Y. | Philip Goodman (With distinction) | N.Y. |
| Richard Grant Call Don Bruce Cameron | N.Y. | B.S. 1956, Union College | |
| A.B. 1952, University of California at Los Angeles | Idaho | William Gene Grundon (With distinction) | Calif. |
| Robert Wendell Cantrell A.B. 1958, The George Washington University | Va. | A.B. 1956, San Diego State College | |
| David Roland Carlson B.S. in Phar. 1953, Drake University | Mo. | Ronald Edgar Gunther (With distinction) | N.J. |
| Robert Lee Carter A.B. 1955, Washington and Jefferson College | Ill. | B.S. 1958, Utah State University of Agriculture and Applied Science | |
| Arnold Lowell Case A.B. 1956, Yale University | W.Va. | Barbara Jean Haddad B.S. 1955, University of Miami | Va. |
| Donald Overton Castell A.B. 1956, The George Washington University | Va. | Harold Melvin Hagen A.B. 1956, St. Olaf College | Minn. |
| Robert Joseph Cerenmak A.B. 1956, Catholic University of America | | Ray Russell Hagley A.B. 1957, Marshall College | W.Va. |
| Irving Allen Chris A.B. 1957, Harvard University | Md. | Lorne Franklyn Hall A.B. 1956, Duke University | Conn. |
| Robert William Clevenger A.B. 1956, Duke University | N.J. | Eric James Hanson B.F.A. 1955, Pratt Institute | Va. |
| Sherwood Allan Cole A.B. 1956, University of Buffalo | N.J. | Forrest Glenn Hawkins A.B. 1956, West Virginia University | W.Va. |
| Mary Loretta Coleman A.B. 1949, University of Chicago | N.J. | LeRoy Michael Henrich, Jr. William Randolph Hix | Va. D.C. |
| A.M. 1956, Johns Hopkins University | Pa. | A.B. 1958, The George Washington University | |
| Edward Earl Cunningham A.B. 1952, Washington and Jefferson College | N.Y. | Charles Edgar Hoeg Masaharu Gerald Jinguji | W.Va. Wash. |
| M.S. 1954, Duquesne University | Ill. | B.S. 1952, College of Puget Sound | |
| Charles Dennis Daily, Jr. A.B. 1956, Stanford University | Pa. | Jack Stoddard Johnson Severance Burrage Kelley | Utah W.Va. |
| Jerry DeGroot A.B. 1951, University of Washington | Mo. | A.B. 1956, Ohio University | |
| Vincent Louis DeQuattro B.S. 1955, University of California | Calif. | Joseph William Kraut B.S. 1954, Georgetown University | Ill. Utah |
| John Joseph Dinecher, Jr. A.B. 1951, Colgate University | Calif. | Dan L. London Paul Angelo Manolukas | Va. |
| William John Duxbury B.S. in Phar. 1952, University of Wisconsin | D.C. | B.S. 1950, University of Pittsburgh M.B.A. 1955, University of Pennsylvania | |
| Robert Eugene Eckland A.B. 1956, State University of Iowa | D.C. | Duncan Keith McDonald A.B. 1955, Williams College | D.C. |
| Elliot Martin Eisenstein (With distinction) | D.C. | John Frederick Memmel B.S. 1956, Georgetown University | D.C. |
| B.S. 1956, Franklin and Marshall College | Iowa | Dominica Anne Miletto A.B. 1956, Hood College | Md. |
| Michael Anthony Eufemio A.B. 1956, Cornell University | N.J. | Eugene David Minsel B.S. 1956, University of Maryland | D.C. |
| | N.Y. | Walter Albert Morgan A.B. 1958, The George Washington University | D.C. |
| | | Charles Hammett Myers A.B. 1953, University of North Carolina | D.C. |
| | | Peter John Nachajski A.B. 1956, Brown University | Conn. |

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|---|-------|--|--------|
| Earl Richard Olsen | Wis. | William Waldo Skeen | N.C. |
| B.S. 1956, University of Wisconsin | | A.B. 1956, University of North Carolina | |
| Richard Rolin O'Reilly | Pa. | Joseph Eric Smith, Jr. | Md. |
| (With distinction) | | A.B. 1956, Washington Missionary College | Va. |
| B.S. 1957, University of Pittsburgh | | William Henry Snook | |
| Jerry Michael Parker | Pa. | B.S. in Pharm. 1952, State University of Iowa | Pa. |
| B.S. 1957, University of Pittsburgh | | George Andrew Solack | Calif. |
| John Douglas Pinkerton | Wis. | Barbara Ann Solomon | |
| Willard Samuel Putnam, Jr. | Mass. | A.B. 1953, A.M. 1954, University of California | Fla. |
| A.B. 1944, Harvard University | | Ira David Stein | |
| William Emanuel Roll, Jr. | Va. | (With distinction) | |
| Stephen Warren Rozban | N.Y. | B.S. 1956, Rutgers University | Va. |
| A.B. 1957, Bethany College | | Eugene Octave Sykes Stevenson | |
| Norman Marshall Sawyer | Md. | B.S. 1955, The George Washington University | Calif. |
| B.S. 1949, U. S. Coast Guard Academy | Del. | Dale Duane Stewart | Del. |
| David Lloyd Schafer | Conn. | A.B. 1956, Johns Hopkins University | |
| Elliott Schiffman | | William Stuart Warren | Conn. |
| (With distinction) | | A.B. 1956, Dartmouth College | |
| B.S. 1957, Yale University | N.Y. | Harold Kirk Watson | W. Va. |
| Gerald Arthur Schneider | | B.S. 1956, Bates College | Calif. |
| B.S. 1956, College of William and Mary | | Mark Frederick Wildemann | |
| James Albert Seeley | Idaho | B.S. 1956, University of Maryland | Pa. |
| B.S. 1958, University of Idaho | | Max Wilfred Yeaman | |
| Seth Thomas Shaw, Jr. | D.C. | A.B. 1954, University of California | D.C. |
| A.B. 1958, The George Washington University | | Carl Vernon Yutzy | |
| Arnold Sheinis | D.C. | (With distinction) | |
| B.S. 1948, College of the City of New York | | Bertram Zumoff | |
| Daniel Trundle Shreve | Md. | A.B. 1958, The George Washington University | |
| Carlos Alberto Silva | D.C. | | |
| B.S. 1956, University of Puerto Rico | | | |
| George Washington Simons III | Md. | | |

STUDENTS REGISTERED IN THE SCHOOL OF MEDICINE

1960-61

FIRST YEAR

| | | | |
|---|--|---|-------------------------------------|
| Anderson, Danny F. B.S. 1960, Furman University | Ga. | Hantsoo, Sirja A.B. 1960, Cornell University | Md. |
| Anderson, Harold F. A.B. 1960, Los Angeles State College of Applied Arts and Sciences | Calif. | Hinz, William M. Holmes, John L. House, Homer C. B.S. 1959, Washington and Lee University | Wis. Wash. D.C. |
| Anderson, Todd E. A.B. 1960, DePauw University | Ill. | Hunter, Allan A. A.B. 1960, The George Washington University | D.C. |
| Anderson, William S. B.S. in C.E. 1956, Duke University | Pa. | Hurston, Ronald O. A.B. 1960, Yale University | D.C. |
| Barthelme, Randall A. B.S. 1960, Montana State College | Mont. | Hushaw, John R. A.B. 1960, Occidental College | Calif. |
| Beachy, Lester A.B. 1960, University of Pennsylvania | Pa. | Itsochitz, Samuel B. Jacobson, Cecil Bryant B.S. 1960, University of Utah | D.C. Utah |
| Benz, Richard D. B. B.S. 1960, Springfield College | Ohio | Jones, Thomas L., Jr. Kass, Martin B. Kent, Roy D. A.B. 1958, San Jose State College | Va. D.C. Calif. |
| Benn, Rolf H. A.B. 1960, Johns Hopkins University | Venezuela | Kindred, Clifford J. A.B. 1955, Brigham Young University | Idaho |
| Blakesley, Samuel R. B.S. 1959, University of Arizona | Ariz. | Kniep, William M. A.B. 1955, University of Florida | Fla. |
| Boas, Edward L. B.S. 1960, University of Idaho | Idaho | Koslow, Joel L. A.B. 1960, Harvard College | Mass. |
| Brady, John F. A.B. 1960, Providence College | R.I. | Kulaga, Stanley F., Jr. B.S. 1960, Temple University | Pa. |
| Brazinsky, John H. B.S. 1960, University of Notre Dame | D.C. | Lankalis, Margaret A. A.B. 1960, Immaculata College | Pa. |
| Brink, Edward W. A.B. 1960, Trinity College | Conn. | Lima, John B. A.B. 1960, New York University | N.Y. |
| Burde, David C. B.S. 1958, The George Washington University | Va. | Lobl, Lawrence T. A.B. 1960, The George Washington University | D.C. |
| Buchanan, John G. A.B. 1960, Amherst College | D.C. | Lose, George W. Lyle, Jerry M. Madsen, George F. Maourey, Stanley D. Mavensak, Jerome S. A.B. 1960, Johns Hopkins University | Ohio Pa. Utah N.Y. Wis. |
| Carlson, Andrew B. B.S. 1960, McGill University, Canada | N.Y. | Milne, Milton J. B.S. 1957, University of California | Calif. |
| Carlson, Dwight L. B.S. 1958, University of Rhode Island | Calif. | Morales, Braulio A. A.B. 1960, Lafayette College | Costa Rica |
| Chan, Philip K. Collins, Thomas F. A.B. 1960, Catholic University of America | R.I. Calif. D.C. | Morris, David L. A.B. 1958, University of California | Calif. |
| Cope, John R. B.S. in Phas. 1960, University of Pittsburgh | Calif. D.C. | Morrison, Patrick W. C. A.B. 1960, Western Reserve University | Ohio |
| Cordle, Aaron D. Culver, Harry T. Daines, Jonathan H. Davis, William R. A.B. 1960, University of California | Pa. W. Va. Mich. Utah Calif. | Muir, Bruce B. A.B. 1960, University of California | Calif. |
| Dew, Donald C. B.S. 1960, Brigham Young University | Utah | Myers, Norman C. A.B. 1960, Washington and Jefferson College | Pa. |
| Ebert, Charles D. A.B. 1960, West Virginia University | W. Va. | Neviaser, Jules S. B.S. 1959, Morris Harvey College | D.C. |
| Edwards, Charles B. B.S. 1960, Brigham Young University | Utah | Newell, Peter J. A.B. 1960, Occidental College | N.M. |
| Falor, Stanley L. B.S. 1958, Ohio State University | Ohio | Nintcheff, Peter A.B. 1960, Western Reserve University | Ohio |
| Flanagan, William C. A.B. 1960, University of Virginia | N.J. | Norcross, Frederick C. A.B. 1960, University of Pennsylvania | Md. |
| Frank, William G. B.M.E. 1949, University of Louisville | Va. | Patterson, Robert D. A.B. 1960, University of Missouri | Mo. |
| B.D. 1952, Virginia Theological Seminary | | Perry, James P. A.B. 1960, Middlebury College | Texas |
| Gaither, Robert H. A.B. 1960, Johns Hopkins University | Md. | Petersen, John L. A.B. 1960, Dartmouth College | Wash. |
| Gelet, Theodore R. B.S. 1959, Pennsylvania State University | Pa. | Pick, Ruthann A.B. 1959, Boston University | Ill. |
| Gendelman, Seymour B.S. Phas. 1953, Temple University | Pa. | Pozderac, Rodney V. Regan, Robert M. A.B. 1957, Hamilton College | W. Va. D.C. |
| Hallahan, William F. B.S. 1960, Mount Saint Mary's College, Md. | N.Y. | Rice, Russell R. A.B. 1960, University of Virginia | N.J. |
| Hansen, Kenneth R. B.S. 1959, Utah State University of Agriculture and Applied Science | Idaho | | |
| Hansen, Carl A. A.B. 1952, Princeton University | N.Y. | | |

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|--|------------------------------|---|---------------------|
| Rogers, Jerry B. B.S. 1960, University of Maryland | Mo. | Denison, Edward K. Dermody, William H. B.S. 1959, University of Scranton | W. Va. Pa. |
| Rose, Leslie I. A.B. 1960, The George Washington University | D.C. | Diaz-Granados, Esteban B.S. 1959, Fordham University | Colombia N.J. |
| Rosenberg, Jessica E. Sanchez-Raffucci, Luis A. B.S. 1960, Georgetown University | N.Y. Puerto Rico | Dornfeld, Leslie A.B. 1959, Rutgers University | Pa. |
| Singer, Karl L. B.S. 1959, Washington State University | Wash. | Fagan, Walter J. A.B. 1959, LaSalle College | N.J. |
| Stearman, Mandell D. Streubert, George E. B.S. 1960, Moravian College | D.C. N.J. | Finn, Richard S. B.S. 1954, Rutgers University | N.Y. |
| Suesserman, Herbert I. B.S. 1960, Long Island University | N.Y. | Fleischner, Gerald M. A.B. 1959, Lafayette College | D.C. Unh. |
| Takaki, Richard W. A.B. 1960, Stanford University | Calif. | Foer, Warren H. Gardner, Harvey R. A.B. 1958, University of California | D.C. |
| Tarasuk, Albert P. A.B. 1960, The George Washington University | N.Y. | Goodman, David H. A.B. 1959, University of Pennsylvania | D.C. |
| Triggs, Richard A. B.S. 1959, Long Beach State College | Calif. | Greenberg, Peter I. A.B. 1959, Johns Hopkins University | N.C. |
| Tyson, Roger L. B.S. 1959, University of Idaho | Idaho | Hair, Carolyn J. A.B. 1959, Woman's College of the University of North Carolina | W. Va. |
| Veverbrants, Egils B.S. 1957, University of New Hampshire | N.H. | Harvey, Jack W. B.S. 1959, The George Washington University | Pa. |
| Wartofsky, Leonard B.S. 1959, The George Washington University | D.C. | Higgins, Robert M. Hill, Richard N. A.B. 1959, Johns Hopkins University | Calif. Va. |
| Washington, Alice L. A.B. 1947, Adelphi College | Va. | Hobson, Robert W. B.S. 1959, The George Washington University | D.C. |
| Webster, Thomas M. A.B. 1960, University of Virginia | Va. | Hoffman, Charles J. B.S. 1959, The George Washington University | N.J. |
| White, Gary B. A.B. 1960, Brigham Young University | Utah | Horowitz, Martin I. A.B. 1959, Rutgers University | Calif. |
| White, Gilbert L. A.B. 1958, Stanford University | Calif. | Hovey, Leslie M. A.B. 1959, University of California | Ky. |
| Wier, Charles R. B.S. 1960, American University | Md. | Huffman, Stanley R. B.S. 1959, University of Kentucky | N.J. |
| Yourchek, Walter S., Jr. A.B. 1960, Stanford University | Calif. | Hutton, John E. A.B. 1953, Wesleyan University | Calif. N.Y. |
| Zappia, Robert J. A.B. 1956, University of Rochester | N.Y. | Judd, Howard L. Kadell, Barbara M. A.B. 1958, University of Michigan | Ohio |
| Zeveney, Dennis J. B.S. 1960, Kings College | Pa. | King, Jerome S. A.B. 1959, University of Virginia | Calif. |
| Zimmerman, Jack E. B.S. 1960, University of Maryland | Pa. | Koldinger, Ralph E. A.B. 1959, Stanford University | Ohio |
| SECOND YEAR | | | |
| Barclay, William A. B.S. 1959, Wheaton College | Pa. | Kruse, John C. A.B. 1959, Duke University | Mich. |
| Beaver, Harry C. B.S. 1959, Wheaton College | Pa. | Kuhlman, James M. A.B. 1959, University of Michigan | Switzerland N.Y. |
| Bish, Elizabeth B.S. 1959, Purdue University | Ill. | Lao, Anita I. Lazarus, Gerald S. A.B. 1959, Colby College | Iowa |
| Bradley, Fenwick P. Brown, Joel D. Bruner, Blackwell S. Buckingham, Frank M. A.B. 1959, University of Nebraska | Wash. Md. D.C. N.J. | Leonard, Hiram J. A.B. 1959, State University of Iowa | Ala. |
| Bucknell, Thomas E. B.S. 1958, San Diego State College | Calif. | Lewis, Walter J. A.B. 1955, Birmingham Southern College | N.Y. |
| Butler, James S. B.S. 1959, Juniata College | N.J. | Lyle, Sanford P. A.B. 1959, University of Rochester | N.M. D.C. |
| Bystrom, John T. A.B. 1959, Stanford University | Calif. | McBride, Albert Meade, William S. B.S. 1957, The George Washington University | Canada N.Y. |
| Cohen, Allen B. A.B. 1960, The George Washington University | D.C. | Merrill, Keith W. Michelis, Michael F. A.B. 1959, Columbia University | N.Y. |
| Cohen, Paul G. A.B. 1959, University of Buffalo | N.Y. | Miller, Meredith H. A.B. 1959, Johns Hopkins University | Ariz. |
| Coteila, Michael E. A.B. 1959, Hamilton College | N.Y. | Minas, Thomas F. A.B. 1956, University of Arizona | D.C. |
| Cutshall, Quay B. B.S. 1959, Washington State College | Wash. | Modlin, Barry B.S. 1958, M.S. 1959, The George Washington University | Calif. |
| Daltorio, Ronald A. A.B. 1959, Washington and Jefferson College | Pa. | Moede, Austin L. A.B. 1959, University of California | Pa. Unh. |
| Dear, Steven R. A.B. 1959, University of California | Calif. | Mrkich, Robert Murray, Robert O. A.B. 1959, University of Utah | N.Y. |
| Denaro, Frank B.S. 1959, College of William and Mary | N.Y. | | |

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|--|-------------------------------|--|-----------------------------|
| Nichlas, Richard A. A.B. 1958, Cornell University | D.C. | Barrett, James E. Bedeau, Grover W. A.B. 1958, College of the Pacific | Mass Calif. |
| Peabody, Robert R. A.B. 1958, Stanford University | Calif. | Bell, Clyde L. Bendler, Benne G. Bohan, Michael E. A.B. 1958, LaSalle College | D.C. Ind. Del. |
| Polidoro, Joseph R. A.B. 1959, Rutgers University | Conn. | Brie, Carol R. B.S. 1958, University of Richmond | D.C. |
| Pon, Jose M. B.S. 1959, Catholic University of Puerto Rico | Puerto Rico | Bruent, Alfred W. Buerger, George F. B.S. in Phil. 1957, University of Pittsburgh | Idaho Pa. |
| Purell, Lawrence T. A.B. 1959, Dartmouth College | N.J. | Burcett, Michael T. B.S. 1957, Georgetown University | N.J. |
| Purpura, Anthony G. Rablatt, Robert W. A.B. 1959, Catholic University of America | N.Y. Md. | Buxton, Terry M. B.S. 1959, University of Utah | Idaho |
| Reed, James W. Reiser, Henry C. A.B. 1954, Princeton University | Md. D.C. | Carrell, William D. A.B. 1957, Stanford University | Ariz. |
| Richardson, Eugene L. B.S. 1959, Montana State College | Mont. | Chin, Joyce A. A.B. 1958, University of California | Calif. |
| Robinson, John N. B.S. 1957, University of Maryland | Md. | Choochich, Melvin P. Clothier, Walter J. B.S. 1957, Carroll College | Pa. Wis. Calif. |
| Sacks, Richard P. A.B. 1959, Bucknell University | D.C. | Crandon, Peter L. A.B. 1958, San Jose State College | Calif. |
| Saunders, Barney S. A.B. 1959, University of Colorado | D.C. | Crown, Ronald P. B.S. 1958, American University | D.C. |
| Scheimer, Kenneth E. B.S. 1959, Purdue University | D.C. | Eisenbaum, Sidney I. A.B. 1958, Tulane University | N.Y. |
| Sedgewick, Lloyd E. A.B. 1959, University of Virginia | Va. | Fogel, Michael R. A.B. 1958, Haverford College | N.Y. |
| Shaw, Derek J. B.S. 1959, Brigham Young University | Ind. Idaho | Griffiths, Charles W. Griffiths, Harold M. Guandolo, Vincent L. A.B. 1953, Kenyon College | Calif. Calif. Md. |
| Shepard, Dennis D. B.S. 1959, Oregon State College | Oreg. | Gulak, Hubert M. B.S. 1958, Duquesne University | Pa. |
| Shels, Thomas D. A.B. 1959, Washington State College | Pa. Wash. | Gwinn, Byron C. A.B. 1955, Duke University | D.C. |
| Smith, Mark A. A.B. 1959, Virginia Military Institute | Va. | Hanashe, Jeanne A. A.B. 1958, College of New Rochelle | N.Y. |
| Snider, Alvin B. A.B. 1959, Dartmouth College | Texas | Haney, Leland F. B.S. 1959, University of Idaho | Idaho |
| Steinman, David P. B.S. 1959, The George Washington University | D.C. | Henderson, Robert M. Hiebert, Talmage G. A.B. 1950, University of Kansas A.M. 1954, Ph.D. 1956, The George Washington University | N.M. D.C. |
| Suscum, Rafael A. A.B. 1957, Williams College | Panama N.Y. | Hoexter, Barton A.B. 1958, Kenyon College | Ohio |
| Svoboda, Joseph R. Tabor, David O. Lewent, Dennis D. Loring, Russell H. A.B. 1959, The George Washington University | Mont. N.Y. Utah D.C. | Hoffman, Michael G. B.S. 1958, University of Arizona | Ariz. |
| Toms, William N. Trom, Eugene R. A.B. 1959, University of California | N.J. Calif. | Huffman, Ray T. B.S. 1956, Bowling Green State College | Ohio |
| Tuck, Michael L. A.B. 1958, Carleton College | Calif. | Hurt, Arthur C. A.B. 1958, Stanford University | Calif. |
| Ward, George W. B.S. 1956, U.S. Military Academy | Minn. | Huster, Richard H. A.B. 1958, Duke University | Fla. |
| Ward, Neil O. B.S. 1956, University of Arizona | D.C. | Jackson, Mary M. A.B. 1950, Montana State University | Alaska |
| White, Gerald D. B.S. 1959, Brigham Young University | Ariz. | Janon, Edward A. A.B. 1958, University of Pennsylvania | N.Y. |
| Whitman, Howard J. B.S. 1956, Michigan State University of Agriculture and Applied Science | Wyo. | Jandee, James J. Jones, Lawrence A. Kachmarick, John A. Kauffman, Allan L. B.S. 1958, Wagner Lutheran College | Oreg. Va. Pa. N.Y. |
| Wong, Michael J. A.B. 1959, Stanford University | Mich. | Kundin, Jack E. Latham, John M. B.S. 1952, College of Idaho | N.Y. Idaho |
| Wootton, Devere G. B.S. 1959, Brigham Young University | Calif. Utah | Lapiana, Francis G. Leake, Francis M. A.B. 1958, University of California | Calif. Calif. |
| THIRD YEAR | | Liebler, Fred B. B.S. 1958, University of Pittsburgh | Pa. |
| Allen, George R. B.S. 1959, College of Idaho | Idaho | Liebler, George A. B.S. 1958, University of Pittsburgh | Pa. |
| Anderson, Kathryn A. A.B. 1958, Herman B. | Md. | Loop, Floyd D. B.S. 1958, Purdue University | Ind. |
| Armstrong, Donna J. A.B. 1958, Dartmouth College | N.Y. | Loscher, William R. B.S. 1958, Washington State College | Calif. |
| Armstrong, Lee A. A.B. 1955, Pacific Union College | D.C. Calif. | Lundie, William M. A.B. 1958, New York University | N.Y. |

| Luthringer, David G. A.B. 1958, Princeton University | D.C. | | FOURTH YEAR |
|--|------------------------|--|-------------------------|
| Marshall, John H. B.S. 1958, University of Maryland | D.C. | Akbarian, Mohammed A.B. 1957, The George Washington University | D.C. |
| Mason, John K. B.S. 1954, Rocky Mountain College | Mont. | Alter, Burton N. B.S. 1958, Yale University | Conn. |
| Matan, Joseph A. Mayson, Preston B. B.S. 1955, U. S. Military Academy | Md. S.C. | Altman, Robert L. B.S. 1957, Westminster College | Md. D.C. |
| McBeath, Jo K. B.S. 1957, Idaho State College | Nev. | Anderson, Arthur J. Ankeny, Scott W. A.B. 1954, University of California | Calif. D.C. |
| McCreedy, James E. B.S. 1958, Westminster College | Pa. | Antonioni, Lucy D. A.B. 1958, The George Washington University | D.C. |
| Meymandi-Nejad, Asadullah Micale, Joseph N. B.S. 1957, Rutgers University | Iran N.J. | Atwood, Roger M. A.B. 1957, Carleton College | Minn. Conn. |
| Mihalakis, Isidore B.S. 1958, Moravian College | Pa. | Baer, Howard S. A.B. 1957, Wesleyan University | Md. Ohio |
| Morrell, Robert H. B.S. 1958, University of Oregon | Idaho | Barnhart, Robert M. Barr, Mason A.B. 1957, Haverford College | Calif. |
| Mullen, Ronald E. A.B. 1950, Marion College B.D. 1956, Northern Baptist Theological Seminary | Ill. | Beeman, John A. A.B. 1958, Occidental College | Calif. |
| Nelson, Manfred R. Nickerson, Richard G. A.B. 1958, New York University | Va. N.Y. | Bertsch, Dale R. Bolter, Delano W. Bowen, Violet E. A.B. 1958, The George Washington University | Calif. W.Va. N.J. |
| Oberg, Darrell K. A.B. 1958, University of Pennsylvania | N.J. | Calvo, Robert C. B.S. 1956, Rutgers University | Va. |
| O'Brien, Kevin D. A.B. 1958, Boston College | D.C. | Campbell, Constance J. A.B. 1958, The George Washington University | Ohio Calif. |
| O'Malley, Donald F. Ostler, Richard E. B.S. in Phar. 1950, Idaho State College | Pa. Idaho | Chambers, Clyde F. Clay, John P. A.B. 1956, Occidental College | D.C. |
| Patti, Joseph C. A.B. 1958, Rutgers University | N.J. | Cohan, Allan B. A.B. 1957, The George Washington University | Ill. |
| Peterson, David N. B.S. 1958, Brigham Young University | Minn. | Colmey, Thomas G. A.B. 1957, Duke University | N.D. |
| Pfister, Alfred K. A.B. 1958, Washington and Jefferson College | W.Va. | Conrad, Justin L. A.B. 1957, Northwestern University | Ind. |
| Raphling, David L. A.B. 1959, The George Washington University | Va. | Covell, Jack P. Cowley, Irvin J. Dahlke, Francis G. | Utah Wisc. Ariz. |
| Ricks, David R. Roberge, Richard T. B.S. 1958, University of Idaho | Idaho Md. | Dancer, Jack T. B.S. 1957, University of Arizona | Idaho |
| Roberts, Bobbie L. Rundle, Herman L. A.B. 1958, University of California at Los Angeles | Va. Calif. | Demordaunt, Paul R. Derro, Robert A. A.B. 1957, Harvard University | Mass. N.Y. |
| Seeman, Kenneth R. A.B. 1958, Franklin and Marshall College | N.Y. | Devita, Vincent T. B.S. 1957, College of William and Mary | Md. |
| Severino, Lawrence J. A.B. 1958, Cornell University | N.Y. | Dolan, John A. B.S. 1957, Georgetown University | Idaho |
| Sheldon, Frank C. A.B. 1958, Rutgers University | N.J. | Dunn, Ronald E. B.S. 1957, University of Idaho | Calif. |
| Shifrin, Harris D. B.S. 1958, The George Washington University | D.C. | Fleming, Peter A. A.B. 1956, San Diego State College | N.Y. |
| Smith, Robert V. Sommerstein, Adam Sterling, James A. A.B. 1958, Williams College | Calif. Pa. Md. | Fried, Morton G. A.B. 1957, New York University | N.J. |
| Suescum, Alfredo T. Swenson, Vernon L. Weiss, Lowell M. B.S. 1957, Rutgers University | Panama Utah N.J. | Gallant, Milton A.B. 1957, Rutgers University | D.C. |
| Whiting, Edward G. A.B. 1958, Stanford University | Calif. | Garman, Ray F. A.B. 1957, Johns Hopkins University | Calif. |
| Whyte, Thomas R. B.S. 1958, The George Washington University | D.C. | Gates, Francis K. A.B. 1956, Occidental College | Md. |
| Wilner, Elliot C. A.B. 1958, Columbia University | D.C. | Gering, Henry S. B.S. 1957, The Citadel | Calif. |
| Wing, George L. A.B. 1958, Harvard University | Mass. | Giovannini, Andrew M. A.B. 1957, University of California | Wash. Ohio |
| Wolcott, George J. A.B. 1958, Dartmouth College | Neb. | Graham, Ronald M. Gresinger, Thomas H. A.B. 1957, Williams College | N.J. |
| Young, Lawrence L. A.B. 1958, Stanford University | Ohio | Guiron, Carl R. A.B. 1957, Columbia University | D.C. |
| Young, Stanley B. B.S. 1958, Purdue University | Ind. | Hixon, Clayton A. B.S. 1957, Fairmont State College | Va. |
| | | Hogan, William F. A.B. 1958, The George Washington University | |

| | | | |
|---|---------------------|--|--------------|
| Huang, Kin L. B.S. 1957, University of Maryland | D.C. | Rehmeyer, Richard C. A.B. 1957, Haverford College | Pa. |
| James, William C. A.B. 1954, Harvard University | Pa. | Rosenberg, Robert D. Rowe, Lynn B. | N.H. Utah |
| Jennings, John H. A.B. 1957, Central College | Mo. | Schull, Robert S. A.B. 1957, Tulane University | N.J. |
| Johnson, Bruce M. A.B. 1957, Carleton College | Ohio | Secrist, Wilbur L. A.B. 1957, West Virginia University | W.Va. |
| Katz, Robert Kaufman, Barry M. B.S. 1958, University of Wisconsin | Md. N.Y. | Senior, Robert M. A.B. 1957, Oberlin College | N.Y. |
| Keeler, Frank J. A.B. 1957, Washington and Jefferson College | W.Va. | Sheer, Leon G. A.B. 1958, The George Washington University | Md. |
| Kelly, Robert J. A.B. 1953, University of Missouri | Mont. | Sheffield, William H. A.B. 1957, Yale University | Calif. |
| Knap, Lois E. B.S. 1957, Gustavus Adolphus College | D.C. | Silberman, William C. A.B. 1958, The George Washington University | Md. |
| Knoor, Norman J. Latimer, Ronald G. A.B. 1958, The George Washington University | Md. Md. | Sobhani, Hossein C. B.S. 1957, University of Oklahoma | Iran |
| Lacan, George L. A.B. 1957, Ohio University | Ohio | Stubbs, Peggy A. A.B. 1958, The George Washington University | Va. |
| Major, Robert P. B.S. 1957, Davidson College | N.C. | Tate, Harry R. A.B. 1957, University of Virginia | N.J. |
| Marlow, John L. B.S. 1957, Brigham Young University | Idaho | Tenney, Richard L. A.B. 1957, Duke University | N.J. |
| Mason, James K. A.B. 1959, Montana State University | Mont. | Thompson, William F. B.S. 1957, The George Washington University | Md. |
| Mathis, Jacob L. A.B. 1957, University of California | Calif. | Thornton, Valery A.B. 1958, The George Washington University | D.C. |
| Mazella, Samuel F. A.B. 1957, Cornell University | N.J. | Tucker, Donald J. A.B. 1957, Cornell University | N.Y. |
| McGuire, Francis D. A.B. 1957, New York University | N.J. | Tyerman, Peter A. A.B. 1957, University of Oregon | Oreg. |
| McKay, Donald A.B. 1955, Harvard University | Miss. | Urbanski, Francis X. B.S. 1957, Dickinson College | N.J. |
| Miller, Jay H. B.S. 1957, The George Washington University | Md. | Van Fleet, William V. A.B. 1957, The George Washington University | D.C. |
| Mondtze, Allen M. A.B. 1958, The George Washington University | Md. | Vu, Hau N. Wallman, Arthur A. B.S. 1957, Queens College | Laos N.Y. |
| Moore, James R. B.S. 1957, The George Washington University | Va. | Westfall, Florent F. White, Daniel B. A.B. 1957, Dartmouth College | Md. Mich. |
| Montledge, Thomas E. B.S. 1955, University of Arizona | Mont. | Wood, Warren A. B.S. 1956, Hillsdale College | Mch. |
| Nemeth, Charles Sutter, Donald O. A.B. 1957, Johns Hopkins University | Ill. D.C. | Zelles, Gary W. A.B. 1957, Rutgers University | N.J. |
| Radlauer, Charles B. Ranauer, Fernando E. A.B. 1958, The George Washington University | N.Y. Puerto-Rico | | |

SUMMARIES OF REGISTRATION

1960-61

NUMBER OF REGISTRANTS

| | |
|------------------------------------|-----|
| Class entering September 1960..... | 102 |
| Class entering September 1959..... | 97 |
| Class entering September 1958..... | 96 |
| Class entering September 1957..... | 94 |
| Total..... | 399 |

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

| | | | |
|----------------------------|----|----------------------|----|
| Alabama | 1 | New Mexico | 3 |
| Alaska | 1 | New York | 39 |
| Arizona | 6 | North Carolina | 2 |
| California | 46 | North Dakota | 13 |
| Connecticut | 5 | Ohio | 1 |
| Delaware | 1 | Oklahoma | 3 |
| District of Columbia | 56 | Oregon | 30 |
| Florida | 2 | Pennsylvania | 2 |
| Georgia | 1 | Rhode Island | 1 |
| Idaho | 15 | Texas | 13 |
| Illinois | 7 | Utah | 19 |
| Indiana | 5 | Virginia | 8 |
| Iowa | 1 | Washington | 10 |
| Kentucky | 1 | West Virginia | 4 |
| Maryland | 27 | Wisconsin | 1 |
| Massachusetts | 5 | Wyoming | 3 |
| Michigan | 4 | Puerto Rico | 1 |
| Minnesota | 2 | Canada | 1 |
| Mississippi | 1 | China | 1 |
| Missouri | 3 | Colombia | 1 |
| Montana | 7 | Costa Rica | 1 |
| Nebraska | 2 | Iran | 2 |
| Nevada | 1 | Panama | 1 |
| New Hampshire | 1 | Venezuela | 1 |
| New Jersey | 25 | | |

GRADUATES OF COLLEGES REGISTERED IN THE SCHOOL OF MEDICINE

| | | | |
|--|----|---|---|
| Adelphi College | 1 | Citadel, The | 1 |
| American University | 2 | Colby College | 1 |
| Amherst College | 1 | Colorado, University of | 3 |
| Arizona, University of | 6 | Columbia University | 5 |
| Birmingham Southern College | 1 | Cornell University | 6 |
| Boston College | 1 | Dartmouth College | 1 |
| Boston University | 1 | Davidson College | 1 |
| Bowling Green State University | 1 | De Pauw University | 1 |
| Brigham Young University | 9 | Dickinson College | 6 |
| Bucknell University | 1 | Duke University | 1 |
| Buffalo University | 1 | Duquesne University | 1 |
| California, University of | 14 | Fairmont State College | 1 |
| California, University of at Los Angeles | 1 | Florida, University of | 1 |
| Carleton College | 3 | Fordham University | 1 |
| Carroll College | 1 | Franklin and Marshall College | 1 |
| Central College | 1 | Furman University | 3 |
| Catholic University of America | 2 | George Washington University, The | 3 |
| Catholic University of Puerto Rico | 1 | Georgetown University | 1 |

| | | | |
|---|---|--|-----|
| Gustavus Adolphus College | 1 | Oregon, University of | 2 |
| Hamilton College | 2 | Pacific, College of the | 1 |
| Harvard University | 4 | Pacific Union College | 1 |
| Haverford College | 4 | Pennsylvania State University | 1 |
| Hilldale College | 1 | Pennsylvania, University of | 5 |
| Idaho, College of | 2 | Pittsburgh, University of | 4 |
| Idaho State College | 2 | Princeton University | 3 |
| Idaho, University of | 5 | Providence College | 1 |
| Immaculata College | 1 | Purdue University | 4 |
| Iowa, State University of | 1 | Queens College | 1 |
| Johns Hopkins University | 8 | Rhode Island, University of | 1 |
| Junia College | 1 | Richmond, University of | 1 |
| Kansas, University of | 1 | Rochester, University of | 2 |
| Kentucky, University of | 1 | Rocky Mountain College | 1 |
| Kenyon College | 2 | Rutgers University | 11 |
| King's College | 1 | San Diego State College | 2 |
| Lafayette College | 2 | San Jose State College | 2 |
| LaSalle College | 2 | Scranton University | 1 |
| Long Beach State College | 1 | Springfield College | 1 |
| Long Island University | 1 | Stanford University | 11 |
| Los Angeles State College | 1 | Temple University | 2 |
| Louisville, University of | 1 | Trinity College | 1 |
| Marion College | 1 | Tulane University | 1 |
| Maryland, University of | 5 | United States Military Academy | 2 |
| McGill University | 1 | Utah State University | 1 |
| Michigan State University of Agri- culture and Applied Science | 1 | Utah, University of | 3 |
| Michigan, University of | 2 | Virginia Military Institute | 1 |
| Middlebury College | 1 | Virginia Theological Seminary | 1 |
| Missouri, University of | 1 | Virginia, University of | 6 |
| Montana State College | 2 | Wagner Lutheran College | 1 |
| Montana State University | 2 | Washington and Jefferson College | 4 |
| Moravian College | 2 | Washington and Lee University | 1 |
| Morris Harvey College | 1 | Washington State College | 3 |
| Mount St. Mary's College | 1 | Washington, State University of | 1 |
| Nebraska, University of | 1 | Wesleyan University | 2 |
| New Hampshire, University of | 1 | West Virginia University | 2 |
| New Rochelle, College of | 1 | Western Reserve University | 2 |
| New York University | 5 | Westminster College | 2 |
| Northern Baptist Theological Seminary | 1 | Wheaton College | 1 |
| Northwestern University | 1 | William and Mary, College of | 2 |
| Notre Dame, University of | 1 | Williams College | 3 |
| Oberlin College | 1 | Wisconsin, University of | 1 |
| Occidental College | 5 | Woman's College of the University of North Carolina | 1 |
| Ohio State University | 1 | Yale University | 3 |
| Ohio University | 1 | | |
| Oklahoma, University of | 1 | | |
| Oregon, State College of | 1 | | |
| | | Number of College Graduates... | 309 |
| | | Number of Colleges Represented | 126 |

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District of Columbia General Hospital, Washington, D. C.



The George Washington University Hospital—Clinic Entrance

THE GEORGE WASHINGTON UNIVERSITY

Washington 6. D. C.

Academic programs leading to degrees are offered in the following colleges and schools:

- Junior College: Associate in Arts (A.A.) and Associate in Science (A.S.)
- Columbian College: Bachelor of Arts (A.B.), Bachelor of Science (B.S.), Bachelor of Science in Medical Technology (B.S. in Med. Tech.), Master of Arts (A.M.), Master of Fine Arts (M.F.A.), and Master of Science (M.S.)
- Graduate Council: Doctor of Philosophy (Ph.D.)
- School of Medicine: Doctor of Medicine (M.D.)
- Law School: Bachelor of Laws (LL.B.), Juris Doctor (J.D.), Master of Laws (LL.M.), Master of Comparative Law (M. Comp. L.), Master of Comparative Law (American Practice) (M. Comp. L. (Am. Prac.)), and Doctor of Juridical Science (S.J.D.)
- School of Engineering: Bachelor of Civil Engineering (B.C.E.), Bachelor of Electrical Engineering (B.E.E.), Bachelor of Mechanical Engineering (B.M.E.), Bachelor of Science in Engineering (B.S. in Eng.), Master of Science in Engineering (M.S. in Eng.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)
- School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.) and Master of Science in Pharmacy (M.S. in Phar.)
- School of Education: Bachelor of Arts in Education (A.B. in Ed.), Bachelor of Science in Home Economics (B.S. in H.E.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (Adv. Prof. Cert.), and Doctor of Education (Ed.D.)
- School of Government: Bachelor of Arts in Government (A.B. in Govt.), Master of Arts in Government (A.M. in Govt.), Master of Arts in Public Administration (A.M. in Pub. Adm.), Master of Arts in Personnel Administration (A.M. in Per. Adm.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)
- College of General Studies: Associate in Arts (A.A.(C.G.S.)), Associate in Science (A.S.(C.G.S.)), Associate in Secretarial Administration (A.Sec.Adm.), Bachelor of Arts (A.B.(C.G.S.)), Bachelor of Science in Cartography (B.S. in Cart.), Master of Arts in Controllorship (A.M. in Contr.), Master of Arts in Governmental Administration (A.M. in Govt. Adm.), Master of Arts in International Affairs (A.M. in I.A.), and Master of Arts in Personnel Management (A.M. in Per. Mgmt.)

ANNUAL ISSUES OF THE UNIVERSITY BULLETIN

Requests for the following publications should be addressed as indicated.

| | |
|---|--|
| College of General Studies | Dean of the College of General Studies |
| General Catalogue of the University..... | Director of Admissions |
| Graduate Council..... | Dean of the Graduate Council |
| Law School | Director of Admissions |
| School of Education..... | Director of Admissions |
| School of Engineering..... | Dean of the School of Engineering |
| School of Medicine..... | Director of Admissions |
| Summer Sessions..... | Dean of the Summer Sessions |
| Fellowships, Scholarships, Prizes, Financial Aid..... | Director of Admissions |

THE GEORGE WASHINGTON UNIVERSITY

1821

The Junior College

1930

Columbian College (the Senior College)

1821

The Graduate Council

1893

The School of Medicine

1825

The Law School

1865

The School of Engineering

1884

The School of Pharmacy

1906

The School of Education

1907

The School of Government

1928

The College of General Studies

1950

The Division of University Students

1930

The Division of Special Students

1944

The Division of Air Science

1951

The Summer Sessions

1916

The University Hospital

1898

THE
GEORGE
WASHINGTON
UNIVERSITY

BULLETIN

THE LAW SCHOOL
1961-62



WASHINGTON 6, D. C.
DECEMBER 1960

VOL. LX

No. 4

CORRESPONDENCE DIRECTORY

Detailed information may be obtained by addressing inquiries as indicated below. For any information not included here, please write to the Director of Admissions, The George Washington University, Washington 6, D. C.

Information concerning courses of instruction and the programs of the several colleges and schools will be found in separate issues of the University Bulletin, which are listed on the inside back cover.

| | |
|-------------------------|---|
| Admission..... | Director of Admissions, Building C |
| Air Science (ROTC)..... | Director of Air Science, Chapin Hall |
| Alumni Association..... | Alumni Office, Bacon Hall |
| Foreign Students..... | Adviser to Foreign Students, Building T |
| Graduate Study | |

In Arts and Sciences

| | |
|---|--|
| Master's degrees..... | Dean of Columbian College |
| Doctor of Philosophy..... | Dean of The Graduate Council |
| In Education..... | Dean of The School of Education |
| In Engineering..... | Committee on Graduate Studies, School of Engineering |
| In Law..... | Dean of the Law School |
| In Accounting, Business Administration, Business and Economic Statistics, Economic Policy, Hospital Administration, International Affairs, Personnel Administration, Public Administration, Public Affairs..... | Dean of The School of Government, Business, and International Affairs |

Housing

| | |
|-----------------------------|---|
| Men..... | Director of Men's Activities, Building Q |
| Women..... | Director of Women's Activities, Woodhull House |
| Scholarships..... | Chairman, Committee on Scholarships, Building T |
| Student Employment..... | Student Placement Office, 2114 G Street NW. |
| Summer Sessions..... | Dean of the Summer Sessions, Building T |
| Transcripts of Records..... | Registrar, Building C |
| Veterans Education..... | Director of Veterans Education, Building Q |

THE LAW SCHOOL

1961-62

THE
GEORGE
WASHINGTON
UNIVERSITY
BULLETIN

VOL. LX

No. 4

THE LAW SCHOOL

WASHINGTON, D. C.

PUBLISHED IN DECEMBER
MCMLX

BY THE UNIVERSITY

PUBLISHED BY THE UNIVERSITY
AT WASHINGTON, D. C.
APRIL, JUNE, JULY, AUGUST, OCTOBER, NOVEMBER (2 ISSUES) AND DECEMBER (2 ISSUES)

SECOND CLASS POSTAGE PAID AT WASHINGTON, D. C.

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CALENDAR

1961-62

SUMMER TERM:

1961

| | | |
|---|-------------------|--------------|
| Registration for both sessions | June 12 | Mon. |
| First session begins..... | June 13 | Tues. |
| Independence Day. Holiday..... | July 4 | Wed. |
| Last day of classes..... | July 24 | Mon. |
| First session examination period..... | July 25-27 | Tues.-Thurs. |
| Registration for students attending second session only | July 28 | Fri. |
| Second session begins..... | July 31 | Mon. |
| Labor Day. Holiday..... | Sept. 4 | Mon. |
| Last day of classes..... | Sept. 8 | Fri. |
| Second session examination period..... | Sept. 11-13 | Mon.-Wed. |

FALL SEMESTER:

| | | |
|---|----------------------|-------------|
| Registration* | Sept. 21-23 | Thurs.-Sat. |
| Classes begin | Sept. 25 | Mon. |
| S.J.D. dissertations of Feb. candidates due in Dean's Office..... | Oct. 6 | Fri. |
| Fall Convocation | Oct. 21 | Sat. |
| Application for Feb. graduation due in Registrar's Office | Oct. 31 | Tues. |
| Veterans Day. Holiday..... | Nov. 11 | Sat. |
| Thanksgiving recess | Nov. 23-25 | Thurs.-Sat. |
| Christmas recess | Dec. 22-Jan. 2 | Fri.-Tues. |

1962

| | | |
|--|------------------|------------|
| Classes resume | Jan. 3 | Wed. |
| Last day of fall-semester classes..... | Jan. 20 | Sat. |
| Examination period | Jan. 22-30 | Mon.-Tues. |

SPRING SEMESTER:

| | | |
|---|----------------|-------------|
| Registration* | Feb. 1-3 | Thurs.-Sat. |
| Spring-semester classes begin..... | Feb. 5 | Mon. |
| S.J.D. dissertations of June candidates due in Dean's Office..... | Feb. 9 | Fri. |
| Winter Convocation. Holiday..... | Feb. 22 | Thurs. |
| Application for June graduation due in Registrar's Office | Feb. 28 | Wed. |

* Registration will be held from 10:00 am to 8:00 pm, September 21 and 22 for the fall semester, February 1 and 2 for the spring semester; from 10:00 am to 1:00 pm, September 23 for the fall semester, and February 3 for the spring semester.

| | | |
|--|-------------------|------------|
| Application for 1962-63 scholarships due | March 1 | Thurs. |
| Application for 1962-63 Teaching Fellowships due | April 2 | Mon. |
| Easter recess | April 20-25 | Fri.-Wed. |
| Application for Research Assistantships due | May 1 | Tues. |
| S.J.D. dissertations of October candidates due in Dean's Office..... | May 4 | Fri. |
| Last day of spring-semester classes..... | May 20 | Sat. |
| Examination period | May 21-29 | Mon.-Tues. |
| Memorial Day. Holiday..... | May 30 | Wed. |
| Baccalaureate Service | June 3 | Sun. |
| Commencement | June 6 | Wed. |

THE UNIVERSITY

THE BOARD OF TRUSTEES

The Board of Trustees of the University is composed of the President of the University *ex officio* and the following persons by election:

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Godfrey Leon Munter, A.B., LL.B., LL.D., *Assistant Secretary*

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Eugene Cassin Carusi, A.M., J.D.
*Watson Davis, B.S. in C.E., C.E., Sc.D.
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Alfred Henry Lawson, LL.B., LL.D.
John Keown McKee
Benjamin Mosby McKelway, Litt.D.
James Matlack Mitchell, A.M.
*George Edward Muth, A.B., LL.B.
*Frederick A. Reuter, M.D.
*Charles Sylvanus Rhyne, LL.B., D.C.L., LL.D.
Donald D'Arcy Shepard, LL.B.
Carleton D. Smith
Sidney William Souers, A.B., LL.D.
Lewis L. Strauss, Sc.D., LL.D., L.H.D.
L. Corrin Strong, Ph.B., LL.D.
James Edwin Webb, A.B., LL.D.
*Frank Harvey Weitzel, A.B., LL.B.
Alexander Wetmore, Ph.D., Sc.D.
Watson W. Wise, Ph.B.

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Charles Stanley White, M.D., Sc.D.
Lloyd Bennett Wilson

* Nominated by the alumni.

OFFICERS OF ADMINISTRATION*

THE UNIVERSITY

Thomas Henry Carroll, B.S., M.B.A., D.C.S., *President* (February 1, 1961)
Oswald Symister Colclough, B.S., LL.B., LL.D., *Dean of Faculties; Acting President*
(to February 1, 1961)
_____, *Administrative Secretary*
Henry William Herzog, B.S., *Treasurer*
Claud Max Farrington, A.M., *Assistant to the President*
Joseph Young Ruth, A.B., *Director of Admissions*
Frederick Russell Houser, A.M. in Govt., *Registrar; Secretary of the Faculties*
John Russell Mason, A.M., M.S. in L.S., *Librarian; Curator of Art*
William David Johnson, B.S. in B.A., *Comptroller*
Charles William Cole, Ph.D., *Dean of the Summer Sessions*
Benjamin Douglass Van Evera, Ph.D., Sc.D., *Dean for Sponsored Research*
Mitchell Dreese, Ph.D., *Dean in the Office of the President* (to January 1, 1961)
Virginia Randolph Kirkbride, A.M., Ed.D., *Director of Activities for Women*
Don Carlos Faith, Ph.D., *Director of Activities for Men; Director of Veterans Education*
Joseph Richard Sizoo, A.M., D.D., Litt.D., LL.D., L.H.D., S.T.D., *Director of University Chapel*
Alan Thomas Deibert, A.M., *Adviser to Students from Foreign Countries*
Richard Bernard Castell, A.B., M.D., *Director of Health Administration*
Loretta May Stallings, A.M., *Director of Women's Athletics*
Robert Faris, B.S., *Director of Men's Athletics*
Edward Martin Wall, A.B., LL.B., *Director of Air Science*
John Francis Latimer, Ph.D., *Associate Dean of Faculties; University Marshal*

THE LAW SCHOOL

Charles Bernard Nutting, A.B., J.D., LL.M., S.J.D., LL.D., Litt.D., L.H.D., *Dean of the National Law Center*
Louis Harkey Mayo, B.S., LL.B., J.S.D., *Dean of the Graduate School of Public Law*
Carville Dickinson Benson, A.B., LL.B., S.J.D., *Assistant Dean of the Law School*
Edward Andrew Potts, A.B., LL.B., *Assistant Dean for Development in the National Law Center*

* For the academic year 1960-61.

THE UNIVERSITY

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington, who during his public life urged the establishment of such an institution and who in his will left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university to be established in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature:—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

The George Washington University operates under a charter granted by an act of Congress of February 9, 1821, to Columbian College in the District of Columbia. In 1873 the name was changed to "Columbian University" and in 1904 to "The George Washington University".

The University as it is now organized consists of the Junior College, comprising the work of the freshman and sophomore years; Columbian College, the senior college of liberal arts, which offers work leading to the Bachelor's and Master's degrees; the Graduate Council, which offers work leading to the degree of Doctor of Philosophy; the professional schools, which include Medicine: Law: Engineering: Pharmacy: Education: and Government, Business, and International Affairs; the College of General Studies; the Division of University Students; the Division of Special Students; the Division of Air Science; and the Summer Sessions.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The Law School is a charter member of the Association of American Law Schools and is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association.

LOCATION

The George Washington University is in downtown Washington, four blocks west of the White House and east of the Potomac River with its extensive parkway. Within a few blocks are the buildings housing the offices of many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor. Also readily accessible are the Capitol, the Library of Congress, the National Archives, the Supreme Court, and other federal courts.

THE LAW SCHOOL

THE LAW SCHOOL

THE FACULTY AND STAFF OF INSTRUCTION*

EMERITUS FACULTY

LOYD HECK MARVIN, Ph.D., LL.D., Doctor honoris causa of The George Washington University, *President Emeritus of the University*

CHARLES SAGER COLLIER, *Professor Emeritus of Law*
A.B. 1911, LL.B. 1915, S.J.D. 1932, Harvard University

GEORGE BOWDOIN CRAIGHILL, *Professor Emeritus of Law*
A.B. 1903, University of the South; LL.B. 1906, Georgetown University

JAMES OLIVER MURDOCK, *Professor Emeritus of Law*
Ph.B. 1916, University of Chicago; LL.B. 1924, Harvard University

WYATT LEROY NEWMYER, *Professor Emeritus of Law*
LL.B. 1906, The George Washington University

ACTIVE FACULTY

NICHOLAS EUGENE ALLEN, *Lecturer in Law*
B.S. 1929, Princeton University; LL.B. 1932, Harvard University

WALLACE JOHN BAKER, *Assistant Professor of Law*
A.B. 1946, Dartmouth College; LL.B. 1949, Western Reserve University; LL.M. 1959, Yale University

RONALD AURE BARRON, *Lecturer in Law*
A.B. 1955, Tufts College; LL.B. 1958, Yale University; LL.M. 1960, The George Washington University

STUART ABBOT BEARD, *Professorial Lecturer in Law*
LL.B. 1939, Georgetown University; Judge, Municipal Court for the District of Columbia

AMVILLE DICKINSON BENSON, *Professor of Law; Assistant Dean of the Law School*
A.B. 1920, Johns Hopkins University; LL.B. 1923, S.J.D. 1926, Harvard University

EDWARD BRUCE BILDER, *Lecturer in Law*
A.B. 1949, Williams College; LL.B. 1956, Harvard University

JOHN BODNER, JR., *Lecturer in Law*
LL.B. 1953, Northwestern University

THOMAS HAYWARD BROWN, *Associate Professorial Lecturer in Law*
Member of the bar of the District of Columbia

WILFRED GEORGE COERPER, *Lecturer in Law*
B.S. 1946, U. S. Naval Academy; LL.B. 1954, University of Michigan; A.M. 1957, Ph.D. 1960, Georgetown University

DANIEL FREDERICK COHEN, *Lecturer in Law*
B.S. 1933, Brooklyn College; LL.B. 1936, Brooklyn Law School

HOWARD SYMISTER COLCLOUGH, *Professor of Law; Dean of Faculties; Acting President of the University (to February 1, 1961)*

B.S. 1920, United States Naval Academy; LL.B. 1935, The George Washington University; LL.D. 1960, Muhlenberg College; LL.D. 1958, Dickinson College

*The President of the University, the Dean of Faculties, the Dean of the National Law Center, the Dean and Assistant Dean of the School, the Assistant Dean for Development in the National Law Center, the Registrar of the University, the Director of Admissions of the University, Professors, Assistant Professors, Associate Professors, and Assistant Professors constitute the Faculty.

ROBERT MCKINNEY COOPER, Professor of Law

Ph.M. 1931, University of Wisconsin; J.D. 1934, University of Michigan

JOHN JOSEPH CZYZAK, Professorial Lecturer in Law

A.M. 1939, John Carroll University; LL.B. 1942, Western Reserve University

JAMES FORRESTER DAVISON, Professor of Law

A.B. 1921, LL.B. 1923, Dalhousie University; LL.M. 1924, S.J.D. 1929, Harvard University

ROBERT GALLOWAY DIXON, JR., Professor of Law

A.B. 1943, Ph.D. 1947, Syracuse University; LL.B. 1956, The George Washington University

JUSTIN LINCOLN EDGERTON, Professorial Lecturer in Law

A.B. 1929, LL.B. 1931, The George Washington University

PASQUALE JOSEPH FEDERICO, Associate Professorial Lecturer in Law

A.M. 1925, The George Washington University; LL.B. 1932, Washington College of Law

KITTY BLAIR FRANK, Special Lecturer in Law

A.B. 1943, University of Wisconsin; J.D. 1950, The George Washington University

MONROE HENRY FREEDMAN, Assistant Professor of Law

A.B. 1951, LL.B. 1954, LL.M. 1956, Harvard University

***WILLIAM THOMAS FRYER, Professor of Law**

A.B. 1922, LL.B. 1924, The George Washington University; J.D. 1925, Yale University

GEORGE JOSEPH GOLDSBOROUGH, Associate Professorial Lecturer in Law

B.S. 1947, United States Military Academy; J.D. 1950, The George Washington University

WILLIAM WOOLCOTT GOODRICH, Lecturer in Law

LL.B. 1938, University of Texas

HAROLD PAUL GREEN, Lecturer in Law

A.B. 1942, J.D. 1948, University of Chicago

JACKSON REID HAMBRICK, Associate Professor of Law

A.B. 1938, Wofford College; LL.B. 1942, Duke University

ALFRED HANTMAN, Special Lecturer in Law

A.B. 1939, Brooklyn College; LL.B. 1948, The George Washington University

LOUIS JAMES HARRIS, Professorial Lecturer in Law

A.B. 1932, Cornell University; LL.B. 1939, S.J.D. 1942, Brooklyn Law School; LL.M. 1948, The George Washington University

MURDOCK HEAD, Professorial Lecturer in Forensic Medicine; Chairman, Forensic Medicine Institute

D.D.S. 1947, University of Louisville; M.D. 1953, University of Vermont; LL.B. 1958, The George Washington University

PHILIP FIELD HERRICK, Professorial Lecturer in Law

A.B. 1929, Williams College; LL.B. 1933, LL.M. 1936, The George Washington University

JOHN WINGFIELD JACKSON, Adjunct Professor of Law

B.S. 1928, University of Pennsylvania; LL.B. 1932, The George Washington University

JOHN ALEXANDER KENDRICK, Clerk of the Trial Practice Court

A.B. 1942, LL.B. 1943, The George Washington University

VINCENT KLEINFELD, Lecturer in Law

LL.B. 1929, Columbia University

GUST ANGELO LEDAKIS, Associate Professor of Law

B.B.A. 1953, LL.B. 1955, University of Washington; S.J.D. 1958, University of Michigan

SAMUEL JOSEPH L'HOMMEDIET, JR., Lecturer in Law

B.S. 1949, University of Maryland; LL.B. 1951, LL.M. 1952, The George Washington University

HERBERT JOSEPH LIEBESNY, Associate Professorial Lecturer in Law

J.D. 1935, University of Vienna

* On leave of absence 1960-61.

- WILLIAM THOMAS MALLISON, JR., Professor of Law**
A.B. 1940, University of Washington; LL.B. 1948, Vanderbilt University
- LOUIS HARKEY MAYO, Professor of Law; Dean of the Graduate School of Public Law**
B.S. 1940, United States Naval Academy; LL.B. 1949, University of Virginia; J.S.D. 1953, Yale University
- JOHN JOSEPH McAVOY, Assistant Professor of Law**
A.B. 1934, LL.B. 1938, University of Idaho; LL.M. 1939, Yale University
- JOHN ALBERT McINTIRE, Professorial Lecturer in Law**
A.B. 1928, LL.D. 1934, Wittenberg College; LL.B. 1931, University of Cincinnati
- LEROY SORENSON MERRIFIELD, Professor of Law**
A.B. 1938, LL.B. 1941, University of Minnesota; M.P.A. 1942, S.J.D. 1956, Harvard University
- GEORGE EDWARD MONK, Professorial Lecturer in Law**
A.B. 1928, LL.B. 1930, LL.M. 1934, The George Washington University
- FRANK HAMMETT MYERS, Adjunct Professor of Law**
LL.B. 1923, LL.M. 1924, The George Washington University; Judge, Municipal Court for the District of Columbia
- RALPH CLARKE NASH, JR., Lecturer in Law**
A.B. 1933, Princeton University; J.D. 1937, The George Washington University
- CHARLES BERNARD NUTTING, Professor of Law; Dean of the National Law Center**
A.B. 1927, J.D. 1930, State University of Iowa; LL.M. 1932, S.J.D. 1933, Harvard University; LL.D. 1957, University of Pittsburgh; Litt.D. 1957, Geneva College; L.H.D. 1957, Seton Hill College; LL.D. 1960, Dickinson College of Law
- †HERMAN ISRAEL ORENTLICHER, Professor of Law**
A.B. 1933, LL.B. 1936, Harvard University
- EDWARD ANDREW POTTS, Lecturer in Law; Assistant Dean for Development in the National Law Center**
A.B. 1949, University of Michigan; LL.B. 1952, The George Washington University
- ROBERT NELSON ROBILLARD, Professorial Lecturer in Law**
B.S. 1924, United States Naval Academy; LL.B. 1930, St. John's University School of Law
- PAUL ARCHIBALD ROSE, Associate Professorial Lecturer in Law**
LL.B. 1930, Washington College of Law
- DAVID EARL SEIDELSON, Assistant Professor of Law**
A.B. 1951, LL.B. 1956, University of Pittsburgh
- DAVID JAMES SHARPE, Assistant Professor of Law**
A.B. 1950, University of North Carolina; LL.B. 1955, Harvard University
- GEORGE SHELHORSE, Lecturer in Law**
LL.B. 1951, The George Washington University
- DUDLEY GRAHAM SKINKER, Associate Clerk of the Trial Practice Court**
LL.B. 1940, The George Washington University
- ALEXANDER LOUIS STEVAS, Special Lecturer in Law**
LL.B. 1951, The George Washington University
- JOHN PAUL SULLIVAN, Assistant Professor of Law**
A.B. 1952, Boston College; Ph.B. 1953, St. John's Seminary; LL.B. 1958, Georgetown University
- RALPH JASON TEMPLE, Assistant Professor of Law**
B.B.A. 1953, University of Miami; LL.B. 1956, Harvard University
- ORVILLE HASSLER WALBURN, Professor of Law**
A.B. 1925, Franklin and Marshall College; LL.B. 1930, University of Pennsylvania; J.D. 1932, Georgetown University
- LEONARD PATRICK WALSH, Professorial Lecturer in Law**
A.B. 1927, University of Minnesota; LL.B. 1933, National University; Judge, United States District Court for the District of Columbia

* On sabbatical leave 1960-61.
† On leave of absence 1960-61.

DAVID BENSON WEAVER, Professor of Law

A.B. 1943, Ohio Wesleyan University; LL.B. 1948, Western Reserve University

GLEN EARL WESTON, Professor of Law

B.S. 1943, University of Maryland; LL.B. 1948, The George Washington University

CHARLES JAMES ZINN, Professorial Lecturer in Law

A.B. 1927, LL.B. 1930, Fordham University; LL.M. 1931, S.J.D. 1934, Georgetown University

ASSISTANTS**JOHN CHARLES LYONS, Teaching Fellow**

A.B. 1952, University of Rhode Island; LL.B. 1960, Georgetown University

JACK HARVEY OLENDER, Teaching Fellow

A.B. 1957, LL.B. 1960, University of Pittsburgh

ADMINISTRATIVE ASSISTANTS**Hugh Yancy Bernard, Jr., A.B., B.S. in L.S., Assistant Librarian in charge of the Law Library****Mary White, A.B., Secretary to the Dean of the National Law Center****Isabel Robinson Bilisoly, A.B., Recording Secretary in the Law School****Mary Louise Prista, Secretary to the Dean of the Graduate School of Public Law****Barbara Ellen Parks, Secretary in the Law School****Mary Altha Harcos, Secretary in the Law School****Antonia Sakata Lord, Clerk-Typist****Dorothe Walsh Farquhar, Editorial and Business Secretary of The George Washington Law Review****GENERAL INFORMATION****LOCATION IN THE NATION'S CAPITAL**

The George Washington University Law School, now in its 96th year, is the oldest law school in the District of Columbia. The School took part as a charter member in 1900 in the organization of the Association of American Law Schools and it has been an active member of the Association since that time. It is approved by the Section of Legal Education and Admissions to the Bar of the American Bar Association.

National University, which had had an important place in legal education in the District of Columbia since 1869, was merged into The George Washington University in August 1954.

Of special significance is the location of the Law School in the Nation's Capital, the focal point of the law in action, both American and international. The work of the School goes on in this environment, presenting a unique opportunity for observation and study of federal agencies—judicial, legislative, and administrative. Readily accessible are the Supreme Court of the United States, the federal trial and appellate courts of the District of Columbia, and, in addition, federal courts of special jurisdiction, such as the United States Court of Claims, the United States Court of Customs and Patent Appeals, and the Tax Court of the United States. Current federal legislation can be studied as it is considered by Congressional committees and as it comes up for debate on the floors of the House of Representatives and the Senate. It is with respect to the federal administrative agencies that the students here in Washington have matchless opportunities for study and observation. They can

attend informal and formal hearings of these agencies and can obtain from the docket sections complete records of administrative adjudication in specific cases. Illustrative of such federal agencies are the Interstate Commerce Commission and the Civil Aeronautics Board in the field of transportation; the Federal Trade Commission in the field of trade regulation; the Securities and Exchange Commission in the field of security issues and corporate finance; the National Labor Relations Board in the field of labor-management relations; the United States Patent Office in the field of patent law; the Federal Power Commission in the field of water, natural gas, and electric power; and the Federal Communications Commission in the field of radio and television.

Supplementing these environmental advantages of law in action are the exceptional research library collections in the Library of Congress, in the various departments of the Federal Government, and in the libraries of the headquarters of national and international organizations located in Washington. The notable library of the Carnegie Foundation for International Peace has been acquired by The George Washington University for use of research students in international and comparative law, fields with respect to which Washington has come to be called "The Capital of the World".

The years of residence at law school are years of participation in the life of the community, which in the case of The George Washington University Law School, is the government of the United States by law. As a consequence, the study of law takes on added meaning, whether the goal be government service or practice, general or specialized, and whatever the community in which the student plans to practice.

OBJECTIVES

The primary purpose of the Law School is to prepare men and women to meet the needs of society in the many fields of law, public and private. These needs call not only for technical skill but also for responsible leadership in the development of the law and the administration of justice. In fulfilling these responsibilities the Law School offers: (1) a program of study in preparation for the practice of law; (2) programs of study and research on the graduate level for foreign as well as for American students; (3) a continuing legal education program for members of the bar; (4) institutes and forums on current topics in domestic and foreign law; (5) the publication of a law journal containing the results of research in public law; and (6) the encouragement of student professional co-curricular activities.

PROGRAMS OF STUDY

Traditionally the Law School has been national in the geographic distribution of its students. At the present time, men and women holding baccalaureate degrees from more than three hundred colleges and universities come from the fifty states and several foreign countries to comprise the student body. As a consequence the program of study leading to the degree of Bachelor of Laws has been planned to provide instruction and training for the practice of law wherever the Anglo-American legal system obtains.

Graduate work leading to the degrees of Master of Laws and Doctor of Juridical Science is offered for those desiring further study and research in specialized fields of law.

Provision is made for advanced study by members of the bar who do not desire to

register as candidates for degrees. Lawyers may take courses for this purpose either as unclassified graduate students or as continuing legal education students.

Graduate work is offered also to meet the needs of lawyers who come from countries whose legal systems are not based on the English law. There are two programs of study, one leading to the degree of Master of Comparative Law for lawyers planning to return to their own countries, and the other leading to the degree of Master of Comparative Law (American Practice) for lawyers planning to remain in this country for the practice of law.

ENTERING CLASSES

The curriculum is organized so that students may enter the Law School at the beginning of the fall or spring semester of the academic year, but not at the beginning of the summer term. (For summer term information, see page 30.)

MORNING AND EVENING DIVISIONS

Most morning classes meet for fifty-minute periods between 9:10 A.M. and 1:00 P.M., Monday through Friday; one class and Trial Practice Court meet for two-hour periods on Saturday morning.

Evening classes meet for two fifty-minute periods from 5:50 to 7:40 P.M., Monday through Friday. A four-credit course, e.g., Torts, meets two evenings a week; a two-credit course, e.g., Personal Property, meets one evening a week. The evening division conforms to the standards of the morning division, the full-time faculty participating in the instruction.

THE LIBRARY

The Law Library of 56,400 volumes contains the official reports of the decisions of the courts of last resort of all states prior to the National Reporter System, and of some states complete to date; the National Reporter System, complete; the reports of the United States Supreme Court and lower federal courts, and the reports of federal administrative agencies; Shepard's Citations for the units of the Reporter System; the English Reports, Full Reprint; the English Law Reports; the Times Law Reports; the Dominion Law Reports; the United States statutes and codes; complete sets of statutes of all the states; the English statutes; the principal English and American digests and encyclopedias; collections of special reports and annotated cases; United Nations documents; and leading textbooks and treatises. Approximately 325 legal periodicals are currently received. A section of the library, consisting of books acquired from National University, is known as the National University Law Collection.

Also available to law students are 50,000 bound volumes and 20,000 pamphlets of the former library of the Carnegie Endowment for International Peace, in the fields of international law and relations, history, and economics, in the University Library.

The Law Library, which is on the fourth floor of Stockton Hall, is open from 9:00 A.M. to 10:00 P.M., Monday through Friday; from 9:00 A.M. to 5:00 P.M. on Saturday; and from 2:00 to 6:00 P.M. on Sunday. Books and other materials do not circulate and must be used in the library.

THE LAW REVIEW

The *George Washington Law Review*, published by the University, is edited and managed by students of the Law School under the supervision of faculty advisers. It is devoted exclusively to state and federal public law. The location of the University in the National Capital, where the primary sources of federal public law may be observed in operation, affords an unexcelled opportunity for specialization in this field.

The *Review* organization includes a faculty editor-in-chief, an associate faculty editor, a faculty board of advisory editors, a board of departmental advisory editors, and a board of student editors. The student editors are chosen each year on the basis of scholarship from full-time and part-time students.

THE STUDENT BAR ASSOCIATION

Every student in the Law School is a member of the Student Bar Association, which is organized to enable students to become better acquainted with problems of the profession, to foster professional ideals, and to bring about closer contact with members of the profession engaged in active practice of the law. The work of the Student Bar Association is carried on by various committees and by group and general meetings of a professional and social nature. From time to time lectures are given by outstanding authorities on legal and professional problems.

An important activity is the Van Vleck Case Club Competition, which provides an opportunity for training in appellate advocacy. First and second year students participate as contestants before courts composed of members of the Faculty and the local bar. Senior law students of the Case Club also sit as judges. The final argument is held before a court composed of distinguished federal judges.

The Legal Aid Program is under the joint sponsorship of The George Washington University Student Bar Association and the Junior Bar Section of the District of Columbia Bar Association. Participating students assist court-appointed attorneys in the preparation of cases for trial or appeal. Qualified second- and third-year students are eligible for participation in the program.

In the ranking of member associations by the American Law Student Association, The George Washington University Student Bar Association has received first place twice and second place twice in the past six years.

ORDER OF THE COIF

The Order of the Coif, a national honor society with chapters in over forty law schools, aims "to foster a spirit of careful study and to mark in a fitting manner those who have attained a high grade of scholarship." The George Washington University Chapter was established in 1926. Members are elected each year from the highest-ranking 10 per cent of the graduating class of the Law School.

ADMISSION

APPLICATION FOR ADMISSION

The Law School, like other colleges, schools, and divisions of the University, is coeducational.

Bachelor of Laws candidates may begin their studies in the fall or spring semester but not in the summer term.

Forms for application for admission are available at the Office of the Director of Admissions, 2029 G Street NW., Washington 6, D. C.; telephone: FEderal 8-0250, extension 344. The completed form should be returned to the Office of the Director of Admissions, with an application fee of \$10 for a degree candidate, \$5 for a non-degree candidate. Two recent photographs must accompany the application.

A legal aptitude test is required for the admission of candidates for the degree of Bachelor of Laws. Information regarding the taking of such test may be obtained from the Dean of the Law School or from the Educational Testing Service, 20 Nassau Street, Princeton, New Jersey, which administers the Law School Admission Test at various centers of the United States in February, April, August, and November each year. Completed application blanks and fees must be received by the Educational Testing Service at least two weeks before the date of the test. It is not necessary that formal application for admission to the Law School be made prior to taking the test.

In order to provide sufficient time for the evaluation of credentials, the legal aptitude test score in addition to other papers should be received by July 1 for fall semester admission or by January 1 for spring semester admission. Credentials for summer term admission should be received by May 1.

Requirements concerning records of higher institutions attended are set forth on the sheet attached to the application blank.

Attendance at classes is limited to students registered for credit and Continuing Legal Education students. "Auditing" classes is not permitted.

REQUIREMENTS FOR ADMISSION

For the Degree of Bachelor of Laws

Bachelor of Laws.—A Bachelor of Arts or equivalent degree awarded upon completion of a four-year course in an approved college or university is required. The baccalaureate record must be of satisfactory quality and must include an acceptable distribution of courses. Eligibility is evaluated on the basis of personal and scholastic records, supplemented by the result on the legal aptitude test. An applicant will not be admitted who has been in attendance at another law school and who is ineligible to return to that school in good standing. From the applicants, a selection will be made by the Committee on Admissions.

Juris Doctor.—A student does not register as a candidate for this degree until last year in the Law School.

The degree of Juris Doctor will be discontinued effective with respect to students entering the Law School in the 1961-62 academic year.

ADVANCED STANDING

Advanced standing toward the degree of Bachelor of Laws is granted only for work successfully completed in other law schools which are members of the Association of American Law Schools. Transferred credits will not be recognized in excess of those which might be earned in a similar period in this Law School.

Advanced standing will not be granted for law work already counted toward the Bachelor of Arts or other pre-legal degree.

Advanced standing will not be granted toward meeting the requirements for the degree of Master of Laws.

For the Graduate Degrees

Candidates for graduate degrees must be accepted by the Committee on Graduate Studies.

Master of Laws.*—A Bachelor of Arts or equivalent degree from an approved college or university and a Bachelor of Laws or equivalent degree from a member school of the Association of American Law Schools are required. Candidates for admission must have attained a *B* average on all work done for the Bachelor of Laws degree, except that at the discretion of the Committee on Graduate Studies, applicants otherwise eligible may be admitted on proof of experience and attainment as an alternative. Advanced standing will not be granted for credits earned while a candidate for the first degree in law. Credits earned as an unclassified student will not be applicable toward meeting the requirements of the degree unless specific provision therefor is included in the letter of admission.

Master of Comparative Law and Master of Comparative Law (American Practice).—The following are required: (1) the successful completion of and graduation from a course in arts, philosophy, letters, or sciences, equivalent to graduation from a gymnasium, lycee, or liceo; and (2) graduation in law from a recognized foreign university where training was in Civil Law.

Doctor of Juridical Science.—The following are required: a Bachelor of Arts or equivalent degree from an approved college or university; a Bachelor of Laws or equivalent degree, earned with high rank, from a member school of the Association of American Law Schools; and outstanding capacity for scholarly work in the field of law.

Unclassified Students

A degree candidate in good standing at another law school which is a member of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student to earn credits for transfer to the other law school.

A member of the bar or a person, not a member of the bar, who is a graduate of a member school of the Association of American Law Schools may, at the discretion of the Dean, be admitted as an unclassified student.

Unclassified students participate in the work of the course and take examinations. Courses taken by unclassified students will not be credited toward degrees at this Law School.

Continuing Legal Education Students

A simplified admission and registration procedure is used for members of the bar who desire to take courses on a noncredit basis. Continuing Legal Education students may not participate in student activities or benefit from the medical privileges of the University.

REGISTRATION

Before attending classes each student must present himself in person for registration. No student will be registered in the Law School until proper credentials have been filed and approved (see "Admission").

* One-half of the work necessary for graduation from an approved college or university completed prior to entry into military service may be accepted as satisfying the admission requirement for pre-legal work, provided the applicant completed not less than twenty months of continuous service in the armed forces of the United States during World War II and prior to the beginning of the 1948-49 fall semester.

Registration is held in Stockton Hall, 720 Twentieth Street, NW., during the following periods: *fall semester*, September 21 and 22, 10:00 A.M. to 3:00 P.M.; September 23, 10:00 A.M. to 1:00 P.M. *Spring semester*, February 1 and 2, 10:00 A.M. to 3:00 P.M., February 3, 10:00 A.M. to 1:00 P.M.

Registration is for the semester or session only.

A late-registration fee of \$5 will be charged each student who is permitted to register after the regular registration days.

Registration may be changed only with the permission of the Dean.

FEES AND FINANCIAL REGULATIONS

| | |
|---|---------|
| Application fee, charged each applicant for admission as a degree candidate, non-refundable | \$10.00 |
| Application fee, charged each applicant for admission as a nondegree candidate, non-refundable | 5.00 |
| Tuition fee, for each semester hour for which the student registers | 25.00 |
| For the degree of Doctor of Juridical Science: | |
| For work leading to and including the final examinations | 800.00 |
| Special fee, Law School (\$1.25, Student Bar Association activities; \$1.75, <i>Law Review</i>), charged each student in the Law School for each semester or any part thereof except the summer sessions | 3.00 |
| Graduation fee | 25.00 |
| Fee for printing summary of doctoral dissertation | 85.00 |
| Fee for special examinations, for each subject | 5.00 |
| Late-registration fee, charged each student who fails to register within the designated period | 5.00 |
| Change fee, charged each student for each change in program involving one course or more than one course | 2.00 |
| Residence fee,* charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements | 25.00 |
| Service fee, charged each student for late payment of tuition, see "Payment of Fees" | 2.00 |
| Reinstatement fee, charged each student who is reinstated after being suspended for delinquency in fees | 5.00 |

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library; (4) gymnasium privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to the *University Hatchet*, the student newspaper; (7) admission to University debates; (8) medical attention and hospital services as described under "Health Administration", page 25. These privileges, however, with the exception of the issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each semester are due and payable in advance at the time of registration.

Subject to the approval of the Treasurer, a student may sign a contract for semes-

* Payment of the residence fee entitles the student who is granted leave of absence to return and continue his work toward a degree under the requirements which were in force at the time of his first registration but does not count as part of the residence requirement for the degree.

for charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day* in November; one-third on the first working day* in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

A student who fails to meet payments when due but who pays his fees on or before the fifteenth of the month in which payment is due is charged a service fee of \$2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of \$5.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

WITHDRAWALS AND REFUNDS

Application for withdrawal from the University or for change in class schedule must be made in person or in writing to the Dean. Notification to an instructor is not an acceptable notice.

In authorized withdrawals and changes in schedules, financial adjustments will be made as follows:

Fall Semester.—Withdrawal dated on or before the last working day* in October, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in November, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in November.

Spring Semester.—Withdrawal dated on or before the last working day* in February, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in March, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in March.

In no case will a refund be made of the first third of the total tuition charges unless the registration is in advance and the course is dropped before the regular registration day. In this case a withdrawal fee of \$5 is charged and tuition fees refunded. In no case will tuition be reduced or refunded because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this payment be credited to another semester.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Withdrawal from a course or from the University between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

The grade of *F* (to be counted as zero) will be given in a course dropped without the approval of the Dean.

All charges for courses dropped without the approval of the Dean must be met

* The University work week is Monday through Friday, inclusive.

by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

FELLOWSHIPS, SCHOLARSHIPS, PRIZES, LOAN FUNDS

Law School Research Assistantships.—Student research assistantships are available each year to students currently enrolled in the Law School, preference being given to applicants who are completing their second year. Each assistant receives an annual stipend. Awards are made on the basis of academic standing, financial need, and capacity for leadership. Research assistants have duties similar to those of teaching fellows. Applications should be submitted to the Dean of the Law School not later than May 1.

Law School Teaching Fellowships.—Teaching fellowships are available each year to prospective candidates for the Master of Laws degree. Each fellow receives an annual stipend, plus tuition for the academic year. Teaching fellows follow an approved program of study and research, assist members of the Faculty in the guidance of first year students, and supervise student work in legal bibliography and the drafting of legal instruments. Upon satisfactory completion of the year's work, a fellow is recommended for the degree of Master of Laws. Applications should be submitted to the Dean of the Law School not later than April 1.

Charles Worthington Dorsey Memorial Scholarship.—This scholarship, established in 1947 as a memorial to Charles Worthington Dorsey, Bachelor of Laws, '81, Master of Laws, '82, is awarded upon the recommendation of the Faculty of the Law School to a needy and promising graduate of Columbian College or other division of the University, with a Bachelor of Arts or other equivalent degree, who has maintained an average of B as an undergraduate student and who desires to pursue the study of law as a full-time student. The scholarship covers tuition for the course leading to the degree of Bachelor of Laws, provided that the holder maintains an average of B. The right is reserved to suspend the benefits of the scholarship for cause at any time. The scholarship is awarded ordinarily once every three years.

Law School Scholarships.—Scholarships are available each year in the Law School to graduates of accredited colleges. Each scholarship provides full three-year tuition in the morning division of the Law School. Candidates must have graduated in the upper fifth of their class and must have demonstrated qualities of leadership in addition to scholastic attainment. To retain the scholarship, the successful candidate must maintain a B average. Application must be made before March 1 to the Dean of the Law School.

Tuition scholarships are also available to second- and third-year full-time students with A or B averages. Applications should be made to the Dean of the Law School prior to July 1. The scholarships are awarded after the spring semester grades are reported.

Phi Delta Delta Scholarship.—Zeta Chapter of Phi Delta Delta Legal Fraternity (International) offers annually a scholarship in the amount of \$40 to the woman student in the sophomore class who has excelled in scholastic achievement and service to the Law School in her first year.

Charles Glover Prize.—This prize, established in 1957 by Charles Carroll Glover, Jr., a Trustee of the University, in memory of his great-grandfather, Charles Glover, an illustrious member of the bar of the District of Columbia, consists of selected law books and is awarded annually to the student in the Law School who has attained the highest average grade in the third-year, full-time course.

Kappa Beta Pi Prize.—Eta Alumnae Chapter of Kappa Beta Pi Legal Sorority offers an annual prize which consists of a copy of Blackstone's *Commentaries* or a legal dictionary to be awarded to the woman law student who attained the highest average in her first year.

John Bell Larner Prize.—This prize, established by the bequest of John Bell Larner, consists of a medal which is awarded annually to that member of the graduating class in the Law School who attains the highest average grade in the entire course for the degree of Bachelor of Laws or Juris Doctor.

John Ordronaux Prizes.—These prizes were established in 1909 by the bequest of John Ordronaux.

The amount of \$70 is awarded annually to the student in the Law School who has attained the highest average grade in the first-year, full-time course; and \$70 to the student who has attained the highest average grade in the second-year, full-time course.

Through the generosity of friends of the University a number of loan funds are available to students in the Law School. Application for loans should be made to the Treasurer of the University.

REGULATIONS

Students in the Law School are subject to, and are expected to familiarize themselves with, the general University regulations stated in the University Catalogue.

AMOUNT OF WORK

Students without substantial outside employment may take a program of studies of 14 hours a week. Such students may take courses in the evening only if they are not available in the morning and if a majority of the hours taken are in morning courses. Students with substantial outside employment whether in the morning or evening division, must take a limited program of studies not exceeding 10 hours a week. Students taking a majority of their classes in the evening may not take more than 10 hours a week. A minimum schedule of 10 hours in the morning division and 6 hours in the evening division is required except in exceptional circumstances when a reduced program is authorized by the Dean for continuing students.

ATTENDANCE

Regular attendance at classes is required and is necessary for successful work. A student who is deficient in class attendance in any course may be barred from taking the examination.

RESIDENCE REQUIREMENTS

Candidates for the degree of Bachelor of Laws must complete a residence period of three academic years. Attendance in the morning division for the fall and spring semesters constitutes residence for an academic year; similar attendance in the evening division constitutes residence for three-fourths of an academic year. Consequently, a morning student must attend 6 semesters to meet residence requirements; an evening student must attend 8. Students authorized to take schedules of less than 10 hours in the morning division or less than 6 hours in the evening division receive residence credit on a proportional basis. Students who attend the summer sessions receive fractional residence credit. For details, see page 30.

Students planning to attend summer school sessions at other law schools and desiring to use credits obtained at such schools in their course at this Law School must first have the courses they wish to take approved by the Dean. In no event will credits be recognized in excess of those which might be obtained in a similar period in this School.

GRADUATION REQUIREMENTS

Application for Graduation.—It is the student's responsibility to file an application for graduation in the Office of the Registrar at the time of registration for the last semester of the senior or final year.

Degree Requirements.—The student must meet the curriculum, scholarship, and residence requirements of the degree for which he is registered.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return, unless during his absence he maintains "in residence" status by paying the residence fee, see page 18. For the purpose of this regulation the summer term will be disregarded, unless the degree is to be conferred at the Fall Convocation.

The student who has completed tuition requirements, but whose graduation is deferred for any reason must maintain "in residence" status by paying the residence fee for the semester or summer term immediately preceding the graduation at which he expects to receive his degree.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Presence at Graduation.—A candidate is required to be present at the graduation exercises unless written application for graduation in absentia is approved by the Dean.

EXAMINATIONS

Written examinations are held at the end of each course. Every student is required to take the regular examinations unless excused. No excuse for absence will be granted except by the Dean and then only for illness or other emergency. Application for excuse must be made in writing not later than one month after the date of the examination. An entry of *I*, incomplete, will be made on the record of a student thus excused. To receive credit for the course, he must take the next regularly scheduled examination.

Permission to take an examination before the regularly scheduled date will not be granted. Permission to take a postponed examination is limited to the situation provided for in the preceding paragraph.

A special examination will be granted only to a student entitled to take a postponed examination, who is a candidate for a degree to be conferred at a convocation which precedes the next regular examination in the subject. Written application, showing sufficient cause, should be addressed to the Dean, and approval will be granted at the discretion of the Faculty.

If a student fails to take an examination, a grade of *F* (to be counted as zero) will be recorded unless he has been excused from the examination as provided above or has obtained the Dean's permission to drop the course.

GRADES

Grades are indicated by the letters *A*, excellent, 85-100; *B*, good, 75-84; *C*, satisfactory, 65-74; *D*, poor, 55-64—below standard for graduation; *F*, failed—below

55; *I*, incomplete—student excused from failure to take regularly scheduled examination; and *E.A.*, excessive absences. See "Examinations" above, for grade upon failure to take an examination. The grades *A*, *B*, *C*, and *D* mean that the work has been completed and credit given for the courses. *D* grades, however, do not represent satisfactory work and adversely affect a student's cumulative average. *F*, failed, means that no credit will be given.

A student may not repeat a course he has failed except by permission of the Faculty.

The cumulative average of a student includes all the grades in all the courses taken while he is in the Law School as a candidate for a particular degree. When a course is repeated, both the first grade and the subsequent grade or grades are counted in the cumulative average.

EXCLUSION AND PROBATION FOR POOR SCHOLARSHIP

Candidates for the Degrees of Bachelor of Laws and Juris Doctor.—A student will be excluded who fails in courses aggregating 8 or more semester hours in one semester or in two successive semesters, or who fails in courses aggregating 10 or more semester hours during his period of law study. A student subject to exclusion under this provision who is currently registered will be permitted to complete the work of the semester.

A student not subject to exclusion under the foregoing rule who at any time fails to maintain a cumulative average of at least *C* will be placed on probation. A student on probation may at the discretion of the Dean be required to reduce his program of study. If a student on probation does not, by the end of the second semester following that in which his average has fallen below *C*, receive grades sufficient to give him a cumulative average of at least *C*, he will be excluded. If a student on probation attains a cumulative average of at least *C* by the grades received during the semester his status will then become clear. A maximum of three semesters of probation is allowed. Thus, if a student whose status has become clear after two semesters of probation subsequently goes on probation, he will be allowed only one semester of probation in which to raise his average to at least *C*.

In special cases in which a student who has been excluded can clearly demonstrate that his low grades were due to special circumstances beyond his control and that he has the capacity to pursue the study of law with a definite likelihood of success, such student may be readmitted by the Faculty subject to such conditions as the Faculty may impose.

Candidates for Graduate Degrees.—A candidate for one of the graduate degrees whose work is not satisfactory in the opinion of the Faculty, taking into consideration the requirements and standards for the degree, may, by action of the Faculty, be excluded at the end of the semester for which he is currently registered.

Unclassified Students.—An unclassified student whose work is not satisfactory in the opinion of the Faculty may, by action of the Faculty, be excluded at the end of the semester for which he is currently registered.

CLASSIFICATION OF STUDENTS

Candidates for the degree of Bachelor of Laws are divided into classes on the completion of semester hours as follows: (1) full-time students: first year, 1-23; second year, 29-56; third year, 57 or more; (2) part-time students: first year, 1-20; second year, 21-40; third year, 41-60; fourth year, 61 or more.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

RIGHT TO DISMISS STUDENTS

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Faculty) for subsequent registration.

The right is reserved by the University to dismiss or exclude any student from the University or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

STUDENT LIFE

LIVING ACCOMMODATIONS

The University maintains four residence halls. Meals are served at the Student Union.

Admission to the University does not include room reservation. A separate application for a room should be made well in advance (for the fall semester by May 1, for the spring semester by January 1). Forms for application, together with detailed information, may be obtained from the Director of Activities for Women or the Director of Activities for Men.

Information concerning private rooming and boarding facilities near the University may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

Girls under the age of twenty-one who are enrolled for twelve or more semester hours of academic work in the University and who are not living with their parents or relatives may live outside the Dormitories only with the permission and approval of the Director of Activities for Women, upon receipt of written requests from parents. Permission is not granted for such girls to live outside the dormitories except with persons approved by the Director of Activities for Women.

Women Students.—The Hattie M. Strong Hall provides single rooms at \$15 a month and double rooms at \$40 a month a person.

The Dolly Madison Hall provides double rooms at \$40 a month a person.

Men Students.—Welling Hall provides double rooms at \$30 a month a person.

The John Quincy Adams Hall provides 69 double rooms, each with study alcove and bath. Rooms rent at \$40 a month a person.

Dormitory payments are due and payable in advance on the first day of each month. A student who fails to meet payments when due, but who makes his payment from the tenth to the fifteenth, inclusive, of the month in which payment is due, is charged a service fee of \$2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued rent and a reinstatement fee of \$5.

PLACEMENT

The Law School takes a continuing interest in the placement of its students and graduates and maintains a limited placement service for that purpose. The Dean, the Faculty, and the University Placement Office cooperate in collecting information from alumni of the Law School, law firms, and government agencies concerning opportunities for legal positions throughout the country. Students and recent graduates are invited to discuss their placement problems.

In addition, the University Placement Office, 2114 G Street NW., provides assistance to students seeking full- and part-time employment. This office maintains a registry of positions locally and nationally available and refers qualified applicants for consideration. Information is also available on Civil Service examinations.

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary school; (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.* All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week), is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the departments of physical education.

THE DEGREES OF BACHELOR OF LAWS AND JURIS DOCTOR

The programs of study leading to the degrees of Bachelor of Laws and Juris Doctor are addressed to the development and application of legal principles, skills, and

* See Rule (3) for exception.

SECOND YEAR

| FALL SEMESTER | Semester Hours | SPRING SEMESTER | Semester Hours |
|-----------------------|-------------------|--------------------------|-------------------|
| Civil Procedure | 4 | Constitutional Law | 4 |
| Real Property | 4 | Conveyances | 2 |
| Electives | 2 | Electives | 4 |
| Total..... | 10 | Total..... | 10 |

THIRD YEAR

| FALL SEMESTER | Semester Hours | SPRING SEMESTER | Semester Hours |
|--------------------------|-------------------|-----------------|-------------------|
| Administrative Law | 4 | Evidence | 4 |
| Electives | 6 | Electives | 6 |
| Total..... | 10 | Total..... | 10 |

FOURTH YEAR

| FALL SEMESTER | Semester Hours | SPRING SEMESTER | Semester Hours |
|----------------------------|-------------------|----------------------------|-------------------|
| Trial Practice Court | 2 | Trial Practice Court | 2 |
| Electives | 8 | Electives | 8 |
| Total..... | 10 | Total..... | 10 |

GRADUATE PROGRAM

DEGREES OF MASTER OF LAWS AND DOCTOR OF JURIDICAL SCIENCE

The administration of justice under law is a matter so vast and complex that some graduates feel the need for further study to broaden and deepen their understanding of the law. Others wish to extend their study into rapidly developing specialized fields. Graduate instruction, leading to the degree of Master of Laws enables qualified students to attain one or both of these objectives.

The degree of Doctor of Juridical Science is offered for selected students whose aim is to extend still further their studies by pursuing original research in law.

Graduate work is available to evening as well as morning students for the convenience of lawyers in private practice and in government service.

PROGRAMS OF STUDY FOR FOREIGN LAWYERS

Two programs of study are provided for lawyers who come from countries whose legal systems are not based on the English law. The degree of Master of Comparative Law is planned for those who wish to understand our system so that they may work intelligently with its materials and practitioners after returning to their own countries. The degree of Master of Comparative Law (American Practice), with an appropriate and more intensive program of study, is offered for foreign lawyers who wish to practice in a common law jurisdiction. Comparative Law students are not assigned to special classes but work in association with the students in the regular courses. Each student's program is adapted to his individual needs.

NONDEGREE STUDY: CONTINUING LEGAL EDUCATION

An important part of the graduate program is the offering of courses in various fields of the law for members of the bar not interested in degree candidacy but

desirous of keeping abreast of current developments. The offerings in the field of governmental regulation provide opportunities for specialization. Although third-year and graduate courses are particularly suitable, first-year and second-year courses may be taken in appropriate cases. Members of the bar taking graduate work in this way register as unclassified students or as Continuing Legal Education students.

RESEARCH IN PUBLIC LAW

Research in public law is conducted under the supervision of members of the Faculty. The purpose of this research is to furnish means for training specialists in public law, either as government lawyers or as lawyers representing individuals or corporations in cases in which the Government is a party; and to assist in the analysis, clarification, formulation, and improvement of public law, substantive and procedural.

Candidates for the graduate degrees in the Law School and specially qualified seniors may pursue this work.

REQUIREMENTS FOR THE DEGREES

MASTER OF LAWS

To be recommended for the degree of Master of Laws (LL.M.) the student must have completed a residence period of not less than two semesters. Such residence should normally be continuous. All requirements for the degree must be completed in this Law School and in a period not exceeding two years after registration for work for the degree. The student must have completed, with a minimum average of B, 20 semester hours in courses listed in the law curriculum as graduate courses except that in appropriate cases second- and third-year courses may be approved for inclusion in the program of study if not previously taken.

MASTER OF COMPARATIVE LAW

The degree of Master of Comparative Law (M.Comp.L.) is for foreign students who intend to return to their countries. To be recommended for this degree the student must have completed a residence period of not less than one academic year. He must have completed satisfactorily 24 semester hours in approved courses in the curriculum of the Law School or of such other departments of the University as the Faculty of the Law School shall approve.

MASTER OF COMPARATIVE LAW (AMERICAN PRACTICE)

The degree of Master of Comparative Law, American Practice (M.Comp.L.(Am. Prac.)) is for foreign students who intend to remain in this country. To be recommended for this degree the student must have completed a residence period of not less than one academic year. He must have completed 28 semester hours in approved courses in the curriculum of the Law School with a cumulative average of at least C.

DOCTOR OF JURIDICAL SCIENCE

To be recommended for the degree of Doctor of Juridical Science (S.J.D.) the student must have completed a residence period of not less than one academic year.

He must have pursued a course of study and research designated by his consultative committee and approved by the Committee on Graduate Studies. At the conclusion of his first year of residence, or at such other time as the Committee on Graduate Studies may set, the candidate must pass an oral examination in those fields of study selected by the consultative committee. This examination is conducted by the consultative committee and such other members of the Faculty and qualified experts as are selected by the Committee on Graduate Studies.

No later than the date specified in the University calendar the candidate must submit to the Dean three complete copies of the dissertation together with a fourth copy of the summary. It is the responsibility of the candidate for a Doctoral degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the dissertation, which are rigidly enforced. To be acceptable the dissertation must, in the opinion of the examining committee, constitute a substantial contribution to the field of law concerned and be suitable for publication. Additional information will be supplied by the Chairman of the Committee on Graduate Studies.

The summaries of accepted dissertations will be printed in a numbered issue of the University BULLETIN. The successful candidate for the doctorate is required, before receiving his degree, to pay a fee to cover the expense of printing the summary of his dissertation.

SUMMER TERM

A term of two sessions, with morning and evening classes, is offered in the summer. Continuing students and transfer students may register for either or both sessions. No beginning students are admitted to the summer term.

The summer term is shorter than a semester of the academic year, and, as a consequence, a student must attend two and one-half summer terms to receive residence for one academic year or attend one and one-half summer terms to receive residence for a semester.

A maximum of six semester hours may be taken each session by morning students. Such students will receive two-fifths of a semester of residence credit upon the completion of four or six semester hours in one session, and will receive four-fifths of a semester of residence credit upon completion of eight or more semester hours in two sessions. A maximum of four semester hours may be taken each session by evening students. Such students will receive three-tenths of a semester of residence credit upon the completion of four semester hours in one session, and will receive six-tenths of a semester of residence credit upon the completion of six or eight semester hours in two sessions.

Summer students planning to take the New York bar examination must register at the beginning of the term for both sessions and must complete both and carry a full program of courses.

COURSES OF INSTRUCTION

COURSES OF INSTRUCTION

The courses of instruction listed below are subject to change. The University reserves the right to withdraw any course announced.

First-year courses are numbered from 100 to 200; second-year courses, from 201 to 300; third-year courses, from 301 to 400; and graduate courses, from 401 to 500.

The number of hours of credit given for the satisfactory completion of a course is indicated in parentheses after the name of the course. Thus, a year course giving two hours of credit each semester is marked (2-2), and a semester course giving two hours of credit is marked (2).

Morning classes begin at 9:10 A.M. Evening classes begin at 5:50 P.M.

FIRST YEAR

110 Constitutional Law (4) Mayo, Dixon
 Spring—morning and evening. Basic principles of American constitutionalism; judicial function in constitutional cases; implementation of doctrines of separation of powers, federalism, limited government; development and exercise of national powers; introduction to civil rights and liberties.

115-16 Contracts I-II (4-2) Mayo, Freedman, Temple, Shelhorse
 Academic year—morning and evening; summer 1961. Legal remedies of contracting parties, including damages in contract and quasi-contract, specific performance, reformation, rescission, and remedies in tort; acts creating and terminating contractual rights, including offer and acceptance, mistake, and problems of proof; the function of consideration; conditions; assignments; third-party beneficiaries; the effect of changed circumstances; and protection of the client's interests upon breach or threat of breach by the other party. Emphasis on problems of analysis, draftsmanship, and adversary method.

125 Criminal Law and Procedure (4) Cooper, L'Hommedieu
 Spring—morning and evening. Origin and purposes of criminal law; elements of criminal liability; mental disorders; solicitation, attempt, and conspiracy; crimes against the person, against property, and against both; statutory offenses; criminal procedure, with consideration of Federal Rules of Criminal Procedure.

135 Legal Method and Legal System (4) Fryer, Benson, Orentlicher, Sharpe, Goldsborough, Barron
 Fall—morning and evening; spring—morning and evening. Introduction to substantive and procedural law dealing with basic concepts; training in method and technique of case law and legislation using modern case records; practice in use of law books and in legal writing; importance of language in law; legal reasoning and use of precedents under doctrines of stare decisis, law of the case, and res judicata; development of Anglo-American legal system; organization of judiciary and bar, stressing enforcement of ethical standards.

145 Personal Property (2) Fryer, McAvoy, Sullivan, Nash, Bilder
 Fall morning and evening; spring—morning and evening. Concepts of property, including interests created by bailments, liens, and pledges; methods of acquiring ownership.

150 Real Property (4) Benson, Walburn, Ledakis, Sullivan, Baker
 Fall—morning and evening; spring—morning; summer 1961. Historical background of the law of estates and conveyancing; types of estates; dower and curtesy; landlord and tenant relationship; concurrent estates; future interests at common law and after the Statute of Uses; the Rule Against Perpetuities; incidents of divided ownership, as waste; natural rights.

160 Torts (4) Merrifield, Walburn, Temple
 Fall—morning; spring—morning and evening. Liability for harm to persons or tangible things; defamation and invasion of privacy.

SECOND YEAR

- 201 *Agency* (2) Cooper
 Fall—morning and evening; summer 1961. Master and servant (status of agent), respondeat superior, nature of agency relation, actual authority, parties (disclosed and undisclosed principal), unauthorized transactions, notice, notification.
- 202 *Administrative Law* (4) Davison
 Fall—evening; spring—morning; summer 1961. The position of the administrative process in the separation of powers, including the status of administrative personnel, administrative hearings, judicial scrutiny of administrative action, discretion, and rule-making—particularly as relating to federal administrative agencies.
- 205 *Brief Writing and Oral Argument* (2)
 Not offered 1961-62. Exposition and study of the basic techniques of written and oral legal argumentation. Each student will be required to write, as a term paper, a brief presenting contentions based on the actual record in an unargued case.
- 210 *Business Associations* (4) McAvoy, Seidelson
 Fall—morning and evening; summer 1961. Contrast of the partnership and corporation as alternative forms of organization; organizing partnerships and corporations—formalities, capital contributions, share structure; problems of operation; relations between partners; roles of shareholders, directors, officers; control devices; distributions to owners; voluntary reorganization; dissolution and termination.
- 215 *Civil Procedure* (4) Walburn, Temple
 Fall—morning and evening; summer 1961. The mechanics of litigation—the rules which govern the process by which the rights and duties studied in substantive law courses are enforced: pleadings, discovery, pre- and post trial motions, jurisdiction and venue, applicable law—state or federal, former adjudication. Emphasis is on the Federal Rules of Civil Procedure but the principles and main problems indigenous to procedural systems are developed, thus providing a basis for further study of the various state systems.
- 219 *Commercial Paper* (4) Orentlicher, Ledakis
 Fall—morning and evening; summer 1961. Bills of exchange; promissory notes and checks, especially under the Negotiable Instruments Law; bonds and other forms of investment paper; problems under the Uniform Stock Transfer Act.
- 224 *Commercial Transactions* (4) Ledakis
 Spring—morning and evening. The law relating to the sale and distribution of goods, and to the security financing devices utilized in this connection, with particular attention to the effect of uniform laws.
- 230 *Conveyances* (2) Walburn, Baker
 Fall—morning and evening; spring—evening; summer 1961. Conveyances, recording; easements, profits, covenants, and equitable servitudes; adverse possession and adverse user; zoning and other land controls.
- 235 *Domestic Relations* (2) Potts, Seidelson
 Fall—morning and evening; spring—evening; summer 1961. Marriage, annulment, and divorce; adoption and custody of children; economic relations.
- 238 *Equity* (2) Freedman
 Spring—morning and evening; summer 1961. A correlation of aspects of equity considered in earlier courses, and inquiring into the nature of equity jurisprudence through analysis of selected problems in equity: historical development of equity, including problems of merger of law and equity; use of equity jurisdiction offensively and defensively, including multi-party actions, injunction of executive and legal actions, and equitable abstention; emphasis on the fashioning of equitable remedies.
- 240 *Evidence* (4) Fryer, Weston
 Spring—morning and evening; summer 1961. Functions of court and jury; qualifications and examination of witnesses; opinion, relevancy, and scientific evidence; proof of writing; application of the hearsay rule.

- 243 **Federal Jurisdiction (2)** Cooper
Fall—morning and evening. Constitutional and statutory origins of federal courts, cases arising under the laws and the Constitution, diversity of citizenship, jurisdictional amount, removal procedure and jurisdiction, limitations on federal jurisdiction, state and federal conflicts, substantive law applied by federal courts.
- 251 **Insurance (2)** Temple
Spring—evening; summer 1961. The insurance device in life, property, and other risks.
- 254 **International Law and World Order (4)** Mallison, Czyzak, Coerper
Fall—morning and evening. Traditional content of course in international law presented in context of values and institutions of the world community; formal prescription and effective practice concerning participants in decision-making processes; roles of individuals, international public organizations, political parties, pressure groups, private associations, and national states.
- 259 **Labor Law (4)** Merrifield
Spring—morning and evening; summer 1961. Law governing labor-management relations, organization and representation of employees, regulation of economic weapons, enforcement of collective bargaining agreements, interunion and intraunion relations.
- 265 **Law and Accounting (2)** Hambrick, Weaver
Fall—morning; spring—evening. Study of fundamental accounting principles with emphasis on corporation accounting; legal and accounting implications of specific items on financial statements of corporations; inventory adjustments; corporate transactions, distributions, and capital adjustments.
- 270 **Legislation (2)** Nutting, Mallison
Fall—evening; spring—morning. The legislative process and roles of various participants in the process; operation of the United States Congress and state legislatures, including fact finding, organization, and procedure; problems of statutory interpretation.
- 274 **Taxation—Federal Estate and Gift (2)** Hambrick
Fall—morning and evening. A survey of the substantive provisions of the federal estate and gift tax laws, including inter vivos transfers, transfers in contemplation of death, joint interests, life insurance proceeds, property subject to powers of appointment, the marital deduction and split gifts; tax procedure.
- 279 **Taxation—Federal Income (4)** Hambrick, Weaver
Fall—evening; spring—morning; summer 1961. Survey of substantive provisions of federal income tax, including concept of gross income, limitations on allowable deductions, problems of capital gains taxation, nontaxable exchanges of property, basis problems, provisions affecting the taxation of the family, and principles of income tax accounting.
- 285-86 **Trusts and Estates I-II (2-4)** Weaver, McAvoy
Academic year—morning and evening. An integrated view of considerations (other than tax) in noncommercial transfers of wealth at death or during life with emphasis on the drafting of documents best suited to achieve the wishes of the property owner and meet the needs of his family. *First half*: distribution and administration of intestate estates; formal requirements for execution of wills and trusts; revocation and alteration; grounds for contest; limits on testamentary freedom. *Second half*: dispositive provisions in wills and trusts; common problems of construction; future interests questions including class gifts, powers of appointment, and limits imposed by Rule Against Perpetuities, etc.; problems of administration of estates and trusts including allocations to principal or income, investments, powers to manage, sell, etc.; charitable trusts. Supervised practice in drafting is required. Prerequisite: Law 286; Law 285.
- 295 **Unfair Trade Practices (4)** Weston, Bodner
Fall—morning and evening; summer 1961. Unfair trade practices at common law and under statutes; trade-marks, trade names; copyright law; misappropriation of ideas; protection of competitors and consumers against false advertising under Fed.

eral Trade Commission Act; resale price maintenance under state Fair Trade Acts; state sales-below-cost statutes; Robinson-Patman Price Discrimination Act; miscellaneous business practices.

THIRD YEAR

- 302 *Admiralty* (2) Sharpe
Spring—evening. Federal and state jurisdiction; jurisdiction over waters, craft, contracts, torts, crimes, in equitable matters, etc.; laws applicable to maritime workers and maritime liens.
- 307-8 *Comparative Law I-II* (2-2) Davison
First half: fall—morning and evening. Second half: spring—evening. The Civil Law System; general introduction to foreign law as exemplified by Roman Law and the French and German Civil Codes; comparative study of administration of justice and legal institutions. *Comparative Law I*, dealing with delictual obligations, may be taken independently of *Comparative Law II*, which deals with contractual obligations.
- 309 *Conflict of Laws* (4) Dixon
Fall—morning and evening; summer 1961. Legal problems arising from occurrences transcending state or national boundaries; jurisdiction; foreign judgments; constitutional influences; theoretical bases of choice of law principles and their application to specific fields, including torts, contracts, property, family law, administration of estates, and business associations.
- 313 *Constitutional Interpretations* (2) Dixon
Spring—evening. Advanced course in constitutional law. The Constitution and constitutional tradition, process of judicial decision-making, significance of "due process", current constitutional developments, adequacy of the traditional system of powers and limitations, introduction to comparative constitutional law.
- 318 *Creditors' Rights* (4) Ledakis
Spring—morning and evening; summer 1961. Remedies of unsecured creditors; judgments, fraudulent conveyances, creditors' agreements, equity and statutory receiverships, and bankruptcy. The general approach is that of law administration.
- 321-22 *Current Decisions* (2-2) Weston, Seidelson, Sullivan
Academic year—morning and evening. Required of, and limited to, members of the student staff of the *Law Review*.
- 330 *Federal Antitrust Laws* (4) Weston
Spring—evening. Restraints of trade at common law and under Sherman Antitrust Act of 1890, Federal Trade Commission and Clayton Acts by mergers, monopolies, price-fixing agreements, trade associations, exclusive-dealing agreements, tie-in sales, and trade boycotts; patents and copyrights under antitrust laws.
- 335 *Jurisprudence* (2) Mayo
Fall—evening; spring—morning. History of jurisprudence; schools of jurists, particularly the nineteenth century schools; sociological jurisprudence; theories of justice; the nature of law; law and morals; law and the state; the scope and subject matter of law; sources and forms of law; the traditional element; analysis of general legal concepts.
- 339 *Collective Bargaining and Labor Arbitration* (2) Merrifield
Not offered 1961-62. The collective labor agreement: its content, negotiation, and administration through the grievance procedure and arbitration; problems in the settlement of labor disputes.
- 341 *Labor Standards and Social Security Legislation* (2) Merrifield
Fall—evening. Legal problems arising under federal and state statutes dealing with labor standards and social security. Particular emphasis is placed upon the regulation of wages and hours, workmen's compensation, and insurance against unemployment and old age.
- 345 *Legislative Drafting* (2) Zinn
Fall—evening. Advanced instruction and practice in legislative drafting.

- 349 Local Government Law (2)** Mallison
Spring—evening. The decision-making processes in metropolitan and local communities; types and objectives of city, county, and special function local government units; intergovernmental relations; original organization and changes; local lawmaking; community planning and development.
- 355 Mortgages (2)** Orentlicher, Baker
Spring—morning and evening; summer 1961. Security interests in real property, their creation, transfer, enforcement, and extinguishment.
- 359 Patent Law* (2)** Robillard
Fall—evening. Origin and nature of patents, patentable subject matter, classes of patents, novelty, utility, invention, patent claims and their interpretation, acts constituting infringement, correction of patents.
- 360 Advanced Topics in Patent Law (2)** Harris
Spring—evening. Lectures and discussion; licensing and protection of industrial property; uses and abuses of patents; governmental regulation; protection abroad; the role of patents in business; economic and social functions of patents, trade-marks, and copyrights. Prerequisite: Law 359.
- 362 Patent Office Practice* (2)** Rose
Spring—evening. Rules and practice; appeal and interference procedure.
- 365-66 Patent Trial Practice Court* (2-2)** Brown, Federico
Academic year—evening. Practice before the United States Court of Customs and Patent Appeals and the federal courts. Prerequisite: forty-two semester hours, including Law 215 and 240. Law 359, which is also required, may be taken concurrently. This course may be elected instead of Law 385-86 to satisfy the Trial Practice Court requirement. If *Patent Trial Practice Court* is started in the spring semester, Law 240 may be taken concurrently.
- 370 Public Utilities (2)** Fryer
Spring—evening. Regulation by federal, state, and municipal authorities concerned with licensing, rates, services, and practices, with emphasis on federal regulation of interstate operations; judicial review.
- 376 Restitution (2)** Orentlicher, Sharpe
Spring—morning and evening; summer 1961. Remedies at law and in equity for restitution of benefits conferred, especially as based on the concept of unjust enrichment.
- 380 Suretyship (2)** Orentlicher
Summer 1961. The law of suretyship, especially in the context of accommodation credit and commercial and financial practices, with attention also to informal and non-consensual suretyship relations and the place of suretyship principles in the solution of legal problems generally.
- 385-86 Trial Practice Court (2-2)** Jackson, Myers, Edgerton, Herrick, Monk, Walsh, Beard, Kendrick, Skinker
Academic year—morning and evening. Trial of assigned cases; trial tactics and techniques; pre-trial and court room procedures pursuant to Federal Rules. To be taken in the senior year. Prerequisite: forty-two semester hours, including Law 215 and 240. If *Trial Practice Court* is started in the spring semester, Law 240 may be taken concurrently.
- 391 United Nations Constitutional Law (2)** Mallison
Spring—evening. Structure and process of decision of the United Nations—the peaceful settlement of disputes, collective security, regulation of armaments, regional arrangements, and types of functional cooperation.

GRADUATE COURSES

- 401 Administrative Law Seminar (2)** Davison
Spring—evening. Group study of specific problems in administrative law.
- * Patent law students may take Law 359 and Law 365 concurrently in the fall semester and Law 362 and Law 366 concurrently in the spring semester.

- 408 *Constitutional Law Seminar* (2) Nutting, Dixon
Spring—morning. Group study of contemporary problems in constitutional law.
- 412 *Control and Use of Atomic Energy* (2) Green
Spring—evening. Various legal problems involved in the control and use of atomic energy will be examined, including the Atomic Energy Act, the policy underlying the present government monopoly, the security problem of safeguarding atomic military information, the implications in prospective industrial control and use, and legal means of protecting personal interests against the possible consequences of atomic warfare.
- 416 *Criminal Practice and Administration* (2) Cooper
Spring—Sat. morning. Group study of the fundamental aspects of criminal procedure with special reference to practice before the District of Columbia and federal courts; the law of arrest, searches and seizures, self-incrimination, the function of the preliminary examination and grand jury, sufficiency of indictments, trial procedure, and the order of pleas and motions. Advance registration; limited to fifteen students.
- 420 *Estate Planning Seminar* (2) Weaver
Spring—evening. Group study of the effective disposition of wealth, *inter vivos* and testamentary gifts, conservation for owner's future use, use of insurance, tax and administrative problems, business interests, pension and profit-sharing arrangements.
- 424 *Evidence and Trials Seminar* (2) Fryer
Fall—evening. Study of selected problems involving presentation of documentary proof and expert testimony in connection with the reforms sought by the Uniform Rules of Evidence and recent developments in the field of forensic medicine.
- 426 *Forensic Medicine* (2) Head, Sharpe
Fall—evening. Introduction to problems created by the relationships between medicine and the law: a survey of the medical professions; medical education, specialties, ethics, and professional organizations; an outline of hospital organization and facilities; selected studies in the analysis and presentation of medical aspects of legal controversies, as in personal injury litigation, workmen's compensation claims, and disputes over mental capacity, both civil and criminal; the lawyer's role in domestic and international governmental activities in medicine and public health.
- 428 *Food and Drug Law* (2) Goodrich, Kleinfeld
Spring—evening. A lecture and discussion course dealing with the Federal Food, Drug, and Cosmetic Act and governmental controls thereunder. Both government and industry viewpoints are considered.
- 431 *Government Contracts I* (2) McIntire
Fall—evening. A consideration of the basic power of the Federal Government to enter into contracts; the nature and construction of such contracts; normal and war or defense powers aspects of government procurement, including administrative and legislative policy and procedures; forms of contracts; standard clauses; advertised bid procedure problems; negotiated contracts; modification of contracts; remedies on contractual claims.
- 432 *Government Contracts II* (2) McIntire
Spring—evening. Special problems in government contracts, including adjustments and relief; procedure for prosecuting claims under government contracts; attempts at price, cost, or profit control; termination. Prerequisite: Law 431.
- 442 *Labor Law Seminar* (2) Merrifield
Fall—evening. Group study of contemporary problems in labor law.
- 449 *Law of the Near East* (2) Liebesny
Fall—evening. A study of the law of the Arab countries, including the basic principles of the Islamic law, an analysis of the present day codes, and an investigation of the Western influences on the laws of the Arab countries.
- 455 *Legal Problems in Modern Methods of Warfare* (2) Mallison
Fall—evening. The contemporary international law of war: legal aspects of modern methods of coercion (economic, political, psychological, and military); regulation of hostilities; the special problems of atomic, bacteriological, and chemical weapons; war crimes.

463 Regulation of Communication Media (2)

Mayo

Fall—evening. An examination of the legal doctrine relating to regulatory practices in the channels of mass communications, i.e., newspapers, motion pictures, and radio-television; analysis of the operational structure of the mass media and the pattern of control exercised by government, private associations, and various community groups; appraisal of the comparative utility of various regulatory techniques for implementing policies affecting these media; special emphasis will be placed on the functions of the Federal Communications Commission.

466 Regulation of Securities and Securities Markets (2)

Cohen

Not offered 1961-62. A study of state and federal laws governing the offering and distribution of securities to the public by corporate issuers and others, the regulation of securities markets, and the rights and liabilities of purchasers under such statutes. Particular emphasis will be given to statutes administered by the Securities and Exchange Commission.

469 Research in Patent, Trade-Mark, and Copyright Law (2)

Harris

Fall—as arranged; spring—as arranged. Registration limited to students with at least a B average who have taken Patent Law I and II and related courses including, as a rule, Trade Regulation Seminar. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day. Registration permitted for one semester only; work must be completed within the semester and paper submitted not later than last day of classes.

471 Research in Public Law (2)

The Staff

Fall—as arranged; spring—as arranged. Registration limited to students with at least a B average who have had a seminar or comparable course in field of proposed research. Request in writing, with proposed outline of topic of research, must be submitted to the Dean at least one month prior to registration day. Registration permitted for one semester only; work must be completed within the semester and paper submitted not later than last day of classes.

475 Taxation—Corporate (2)

Hambrick

Fall—evening. Analytical study of income tax problems in corporate dividends and distributions in redemption of stock; corporate liquidations; reorganizations, mergers, and acquisitions; recapitalizations; organization and sales of corporate businesses; collapsible corporations; carryovers. Prerequisite: Law 279.

480 Taxation—Oil and Gas (2)

Hambrick

Spring—evening. A study of the application of the Federal income tax to the producing segment of the oil and gas industry; common types of interests in producing properties; tax treatment of exploration expenditures; intensive study of problems in the deduction of intangible development and drilling costs; the concept of "economic interest"—who is entitled to depletion?; tax distinctions between leasing transactions, sharing transactions, and sales of oil and gas properties and prospects; "ABC" transactions; organizational problems in oil and gas ventures—joint operating agreements, general and limited partnerships, associations taxable as corporations and pooling arrangements; "carried interests" and other financial arrangements in development of oil and gas properties. Prerequisite: Law 279.

482 Taxation Seminar (2)

Hambrick

Spring—evening. Selected problems in federal income, estate and gift taxation involving factual analysis and legal research, and the preparation of memoranda of law, legislative drafting or other appropriate disposition. Identical problems or cases will be assigned to small groups for development and disposition. Registration subject to approval of teacher. Prerequisite: Law 274 and 279.

487 Trade Regulation Seminar (2)

Weston

Spring—evening. Group study of current problems relating to unfair trade practices and federal antitrust laws.

495 Urban Redevelopment (2)

Orentlicher

Spring—evening. Selected problems in urban redevelopment legislation, with particular emphasis on programs under current federal and state legislation.

DEGREES CONFERRED

BACHELOR OF LAWS

FEBRUARY 22, 1960

| | | | |
|---|--------|---|--------|
| Harold Wallace Adams | Va. | Ronald Paul Maddox | Va. |
| B.S. in E.E. 1934, Purdue University | | A.B. 1952, Swarthmore College | D.C. |
| Victor Agmata, Jr. | Hawaii | Dimitri Peter Mallios | |
| Ed.B. 1957, University of Hawaii | | A.B. in Govt. 1954, The George Washington University | Va. |
| Robert Henry Berdo | Iowa | Edwin Chester Maska | Fla. |
| B.S. 1956, State University of Iowa | | B.S. 1953, University of Pennsylvania | Md. |
| Gilbert Thomas Brophy | | Herbert Dean Morrison | Ill. |
| B.S. in B.A. 1949, University of Florida | | A.B. 1955, Principia College | Hawaii |
| Richard Harvey Childress | | Henry Massao Nitta | |
| B.S. 1954, U. S. Naval Academy | Fla. | A.B. 1953, University of Hawaii | D.C. |
| Granville Hayward Crabtree, Jr. | | Nicholas Stephen Nunzio | |
| B.S. 1956, University of Missouri | D.C. | A.B. in Govt. 1957, The George Washington University | Va. |
| Edmund Parke Crump | | John Petsko | |
| A.B. 1957, The George Washington University | Ohio | A.B. in Govt. 1949, The George Washington University | |
| Louis Joseph D'Amico | | M.S. 1950, Columbia University | Va. |
| A.B. 1956, The George Washington University | D.C. | Leonard Rawicz | |
| Akin Thornwall Davis | | B.S. 1953, University of Connecticut | Va. |
| B.Ch.E. 1953, University of Delaware | Ky. | James Donald Reilly | |
| Henry Coleman Durham | | B.S. 1954, Franklin and Marshall College | Va. |
| B.S. 1953, University of Kentucky | Va. | Charles Augustus Robinson, Jr. | |
| John Hart Duvall | | B.E.E. 1950, University of Virginia | Md. |
| A.B. 1955, Principia College | Iowa | Donald Earl Rohall | |
| Francis Bernard Francois | | A.B. 1956, University of Pittsburgh | D.C. |
| B.S. 1956, Iowa State College of Agriculture and Mechanic Arts | Md. | Joel Bruce Rosenstein | N.M. |
| Darrow Glaser | | B.S. 1957, University of Maryland | |
| A.B. 1957, University of Maryland | Va. | Ben Frank Roybal | Ind. |
| Hugh Lee Gordon | | A.B. 1956, New Mexico Highlands University | |
| B.S. in E.E. 1952, University of Maryland | N.Y. | Roger Edward Sanders | |
| William Arthur Grant | | A.B. 1951, Indiana University | |
| B.S. 1948, University of Pennsylvania | | A.M. 1957, Georgetown University | Va. |
| A.M. 1949, Columbia University | Nev. | Julian Schachner | |
| Brian Lionel Hall | | B.S. in M.E. 1956, University of Arizona | Pa. |
| A.B. 1957, University of Nevada | Md. | Royce Wade Snyder, Jr. | |
| Mary Halow | | A.B. 1954, Dickinson College | D.C. |
| A.B. 1956, The George Washington University | Va. | Robert Fred Stauffer | |
| William Joseph Hamon | | A.B. 1951, University of Wyoming | Va. |
| B.M.E. 1953, The George Washington University | | Richard Clifton Sutherland II | Md. |
| Richard Stanley Harsh | Va. | B.S. 1953, Virginia Military Institute | |
| B.S. 1948, U. S. Military Academy | | Donall Hester Sylvester | Ariz. |
| Donald Allen Hoes | Va. | B.S. 1932, Murray State College | |
| B.S. 1954, University of Cincinnati | | John George Thomas | Md. |
| Arthur Jacob | N.J. | B.B.A. 1954, University of Miami | |
| B.S. in M.E. 1954, Massachusetts Institute of Technology | | Turner Clarence Trippe, Jr. | N.J. |
| Elizabeth Rodgers Jager | D.C. | B.S. in B.A. 1942, New York University | |
| A.B. 1945, Smith College | | Frank Philip Trocino | Md. |
| Kenneth Powell Johnson | Va. | A.B. 1956, University of Maryland | |
| B.M.E. 1950, Syracuse University | | Richard Norman Wardell | Ohio |
| Bruce Neal Kannee | Md. | B.S. in Met.E. 1952, Illinois Institute of Technology | |
| A.B. 1957, The George Washington University | | James Godfrey Watterson | Md. |
| William Anthony Kemmel, Jr. | Va. | B.S. in E.A. 1954, Case Institute of Technology | |
| B.S. 1952, M.S. in Chem.Eng. 1953, California Institute of Technology | | Louis Weinstein | Fla. |
| Marie Stuart Kloos | D.C. | B.S. in E.E. 1953, University of Pennsylvania | |
| A.B. 1923, Sweet Briar College | | Arthur George Yeager | N.M. |
| A.M. 1939, Columbia University | | B.E.E. 1956, University of Florida | |
| Dalphine MacMillan | Pa. | Andrew Peter Zimmer | |
| A.B. 1939, Cornell University | | A.B. 1951, Harvard University | |

JUNE 1, 1960

| | | | |
|------------------------------|------|---|------|
| Horace Palmer Beckwith | N.J. | Ernest Albert Beutler, Jr. | Wis. |
| A.B. 1954, Maryville College | | B.S. 1957, Northwestern University | Md. |
| Stephen Lewis Best | Va. | Michael Pemow Breston | |
| A.B. 1955, Kenyon College | | B.S. in E.E. 1955, University of Maryland | |

| | | | |
|--|--------|--|-------|
| Grover Cleveland Brown | Del. | Gerald Lee Moore | Md. |
| A.B. 1957, University of North Carolina | | B.S. in E.E. 1953, Rose Polytechnic Institute | |
| Theodore Locke Brown | Va. | Wayne Allen Morse, Jr. | Va. |
| A.B. 1955, Colby College | | B.S. in B.A. 1948, University of Kansas | |
| Leonard Zinnamon Bulman | D.C. | B.S. in Ed. 1949, Kansas State Teachers | |
| A.B. 1956, University of Maryland | | College, Emporia | |
| James Campbell, Jr. | Va. | Micah Harry Naftalin | Md. |
| B.S. in E.E. 1956, University of Colorado | | A.B. 1955, Brandeis University | |
| Elizabeth Elder Cykowski | Va. | Carl Alfred Nordberg, Jr. | Mich. |
| A.B. 1951, Rutgers University | | A.B. 1957, University of Michigan | |
| Phillip Leroy DeArment | Va. | Henry Joseph Noyes | Md. |
| B.S. 1957, University of Pittsburgh | | B.S. 1951, University of Maryland | |
| Christopher Ogden Duffy | D.C. | Louis B. Oberhauser, Jr. | Iowa |
| B.C.E. 1953, Georgia Institute of Technology | | B.S. in C.E. 1956, Iowa State College | |
| James Francis Duggan | Md. | Robert Leo Olson | Va. |
| B.S. 1953, Georgetown University | | B.S. in Eng. 1956, South Dakota School of | |
| Charles Robert Eastwood | D.C. | Mines and Technology | |
| B.S. in M.E. 1946, B.S. in C.E. 1947, | | Ursula Elizabeth O'Toole | Mich. |
| University of Virginia | | B.S. 1954, Loyola University, Ill. | |
| M.B.A. 1950, Harvard University | | John Edward Pawlick | D.C. |
| Sheldon Engelhard | N.Y. | B.S. 1952, University of New Hampshire | |
| B.S. 1957, Lehigh University | | Joe Lewis Pecore | Oreg. |
| Samuel William Engle | Va. | A.B. 1948, University of Washington | |
| B.S. 1953, Pennsylvania State University | | Marie Magdalen Ritz | Pa. |
| Alvin Morton Esterlitz | Md. | A.B. 1957, The George Washington | |
| B.S. in Ch.E. 1954, Drexel Institute of | | University | |
| Technology | | Mary Trufant Roark | Va. |
| Clarice Rose Felder | D.C. | A.B. 1945, Tulane University | |
| A.B. 1956, The George Washington | | Harold Sidney Schneiberg | D.C. |
| University | | A.B. in Govt. 1957, The George Washington | |
| John Liu Fugh | D.C. | University | |
| B.S. in F.S. 1957, Georgetown University | | Daniel Woolley Shields | Md. |
| Laurence Frederick Gardner | N.H. | A.B. 1949, Princeton University | |
| A.B. 1957, Dartmouth College | | George Atley Skoler | Md. |
| John Francis Gill | N.Y. | A.B. 1952, American International College | |
| B.S. in B.A. 1951, Fordham University | | William Andrew Smith III | Md. |
| Vincent Gerard Gioia | Va. | B.M.E. 1950, Catholic University of America | |
| Met.Eng. 1956, Colorado School of Mines | | Harrison Michael Spence | Va. |
| Gene Wallace Glenn | Iowa | A.B. 1957, University of Idaho | |
| A.B. 1950, State University of Iowa | | George Nicholas Stathopoulos | Mich. |
| Elmer Ellsworth Goshorn | Va. | A.B. 1957, University of Michigan | |
| B.S. in M.E. 1955, Northwestern University | | Samuel Beckner Stone | Md. |
| William Risque Harper | Ky. | B.S. in E.E. 1955, Virginia Polytechnic | |
| A.B. 1956, The George Washington | | Institute | |
| University | | Dudley Breckinridge Thomas | D.C. |
| John Patrick Hazzard, Jr. | Del. | A.B. 1955, Washington and Lee University | |
| B.Ch.E. 1956, University of Delaware | | Norman Gilbert Torchin | D.C. |
| Kenneth James Hixson | Canada | B.S. 1951, The George Washington | |
| A.B. 1956, McMaster University, Canada | | University | |
| Robert Alfred Johnson | D.C. | Kenneth Dale Tremain | Va. |
| B.S. 1950, Ohio State University | | B.S. in Ch.E. 1956, Purdue University | |
| M.S. 1956, Colorado School of Mines | | Marvin Trimas | Va. |
| Stuart Kahn | N.J. | B.S. in I.E. 1956, Pennsylvania State | |
| A.B. 1957, Indiana University | | University | |
| William Houston King | Va. | Wilbur Crandell Tupper | Va. |
| B.S. in E.E. 1950, University of Kentucky | | B.I.E. 1949, Georgia Institute of Technology | |
| Georges Anest Koutras | D.C. | Anthony Charles Vance | Va. |
| A.B. 1954, The George Washington | | B.S. 1954, Pennsylvania State University | |
| University | | Richard Whittington Velde | Va. |
| Gilbert Gerald Kovelman | Va. | B.S. 1953, A.M. 1954, Bradley University | |
| B.E.E. 1956, Cooper Union | | Jerry Thomas Verkler | N.M. |
| Bernard Samuel Leon | N.Y. | A.M. 1954, University of New Mexico | |
| A.B. 1951, New York University | | Tamara Jaffe Wall | D.C. |
| Aaron M. Levine | D.C. | A.B. 1955, Lewis and Clark College | |
| A.B. 1958, Brooklyn College | | Richard Adolf Waterval | Va. |
| Allan Matthew Lowe | D.C. | A.B. 1952, University of Maryland | |
| B.S. 1956, University of Maryland | | Paul Hesse Welch | Va. |
| Francis Richard Malzone | Md. | A.B. in Govt. 1957, The George Washington | |
| B.S. in Ph.D. 1953, The George Washington | | University | |
| University | | William Robert Wendt | Va. |
| Milton Manoukian | Nev. | B.S. in M.E. 1935, University of Wisconsin | |
| A.B. 1937, University of Nevada | | Carl Simpson Willock | Ark. |
| Philip Michael Marfisi | Nev. | B.S. in S.W. 1948, A.M. 1950, University | |
| A.B. 1957, University of Nevada | | of Arkansas | |
| William Alexander Matthews | Va. | Gwenda Pryse Williamson | Md. |
| A.B. in Govt. 1956, The George Washington | | A.B. 1948, Vassar College | |
| University | | Ronald Andrew Willoner | Md. |
| Roy Miller | Calif. | A.B. 1955, University of Maryland | |
| B.S. in M.E. 1956, University of Washington | | Charles Carroll Maccubbin Woodward | Md. |
| Charles Reese Mitchell | Ala. | B.S. in C.E. 1951, Virginia Military Institute | |
| B.S. 1951, University of Alabama | | | |

OCTOBER 22, 1960

| | | | |
|--|------|--|-------|
| Carl Theodore Bodolus | Pa. | Sanford Miller Kesten | Mich. |
| A.B. in Govt. 1954, The George Washington University | | A.B. 1957, University of Michigan | Md. |
| Lester Junod Boykin | D.C. | Stefan Jay Klauber | Utah |
| A.B. 1946, Duke University | | A.B. 1955, Cornell University | Ohio |
| B.S. 1950, U. S. Merchant Marine Academy | | James Bracken Lee | Ohio |
| Darrell Gene Brekke | S.D. | B.S. 1952, U. S. Military Academy | |
| B.S. in E.E. 1954, South Dakota School of Mines and Technology | | James Hunter McNenny | Texas |
| James Ignatius Burkhardt | Pa. | A.B. 1956, Miami University | |
| B.S. 1956, Pennsylvania State University | | John Curtis Moore | D.C. |
| Lawton Arthur Burrows, Jr. | Va. | A.B. 1954, University of Texas | |
| B.Chem.E. 1957, University of Delaware | | Louis Anton Moucha | D.C. |
| William Charles Cahill | Va. | B.S.E. 1950, University of Connecticut | |
| B.E.E. 1955, B.M.E. 1956, University of Akron | | M.S. in E.E. 1952, Lehigh University | D.C. |
| Ronald Sander Cornell | Va. | John Joseph Mullally | Nev. |
| B.S. 1956, Queens College | | B.S. 1953, Georgetown University | |
| Carlton Rhule Crovie | Va. | Vale Patrick Myles | Va. |
| B.M.E. 1956, Clarkson College of Technology | | B.S. in E.E. 1953, University of Nevada | |
| Robert Scott Cullen | Va. | Gayle Parker | Va. |
| A.B. 1954, Washington and Lee University | | B.S. in I.E. 1956, Lafayette College | |
| Julian Falk | Pa. | Donald Lee Prichard | Md. |
| B.S. 1957, Pennsylvania State University | | A.B. in Govt. 1957, The George Washington University | |
| Thomas William Fletcher | Va. | Marvin Reich | Va. |
| A.B. 1951, College of Wooster | | B.S. 1953, Polytechnic Institute of Brooklyn | |
| Arthur Freilich | Va. | Thomas Otto Ruppert, Jr. | Va. |
| B.C.E. 1956, Rensselaer Polytechnic Institute | | A.B. in Govt. 1957, The George Washington University | |
| Meison Gerald Goodweather | Ohio | Alfred William Schumann | Va. |
| A.B. 1954, University of North Carolina | | B.S. 1949, Lewis and Clark College | |
| David Wayne Griffin | Va. | Edward Semmlan, Jr. | Md. |
| A.B. 1956, Catawba College | | A.B. in Govt. 1955, The George Washington University | |
| James John Hamill | Va. | Warrington Gilmore Smith | N.Y. |
| B.M.E. 1957, Georgia Institute of Technology | | B.S. 1949, M.B.A. 1950, University of Maryland | Kans. |
| James Anthony Holtzer | Pa. | Michael Jon Sweedler | |
| A.B. in Govt. 1957, The George Washington University | | B.E. 1957, Yale University | Pa. |
| Florian Harley Jabas | Wis. | Ernest Albert Warden | |
| B.S. 1957, University of Wisconsin | | A.B. 1955, Municipal University of Wichita | |
| Bruce Anderson Jueyer | Wyo. | James Richard Weaver | Va. |
| B.S. in Chem.E. 1957, University of New Mexico | | B.S. 1957, Elizabethtown College | |
| Harvey Kave | Va. | Paul Wohl | |
| B.S. in T.E. 1956, Lowell Technological Institute | | A.B. in Govt. 1954, The George Washington University | |

JURIS DOCTOR

FEBRUARY 22, 1960

| | | | |
|--|-------|--|--------|
| John Robert Cassidy | Va. | Richard Everett Kurtz | Pa. |
| B.S. in I.E. 1953, Pennsylvania Military College | | B.S. in Eng. Phys. 1955, Lehigh University | Pa. |
| Lilla Burr Cummings | D.C. | David Foreman McIntosh | Calif. |
| A.B. 1949, The George Washington University | | B.S. 1952, U. S. Coast Guard Academy | |
| John Powell Diaguind | Md. | Carlton Eugene Russell | Va. |
| A.B. 1954, Virginia Military Institute | | B.S. 1952, U. S. Coast Guard Academy | |
| John Holtz Hagen | Minn. | Mary Helen Sears | D.C. |
| A.B. 1956, St. Olaf College | | A.B. 1950, Cornell University | |
| John Alfred Henry | Maine | Myron Woodrum Solter | Va. |
| A.B. 1952, Bowdoin College | | A.B. in Govt. 1950, The George Washington University | |
| John Norvill Jones | Ark. | Peter Van Dyke Wilde | |
| A.B. in Govt. 1956, The George Washington University | | B.S. in Chem. Eng. 1956, Lehigh University | |

JUNE 1, 1960

| | | | |
|--|-------|---|-------|
| James Chris Cacheris | D.C. | Richard Clarence Cooper | Mich. |
| B.S. 1956, University of Pennsylvania | | B.S. in Ch.E. 1956, Michigan College of Mining and Technology | Mo. |
| Dale Louis Carlisle | Wash. | Chester Leslie Davis, Jr. | |
| B.S. in B.A. 1957, University of Idaho | | B.S. in E.E. 1957, University of Missouri | |
| John Gibson, Jr. | Va. | | |
| A.B. 1956, University of Pittsburgh | | | |

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|---|--------|--|-------|
| William Thomas Fryer III B.S. in E.E. 1955, Lafayette College For Leslie Handley A.B. 1955, University of Colorado | Md. | Reed L. Moss A.B. 1957, Brigham Young University | Idaho |
| Patricia Roberts Harris A.B. 1945, Howard University | Wyo. | Deanna M. Olson B.S. 1957, Brigham Young University | Idaho |
| James Hope Hughes B.S. 1948, University of Oklahoma | D.C. | James Joseph Romano, Jr. M.E. 1956, Stevens Institute of Technology | N.J. |
| Alan David Hutchinson B.S. in B.A. 1956, Ohio State University | Okla. | Paul Joseph Rothman A.B. 1957, Yale University | Maine |
| Stephen Howard Kinney B.S. 1951, U.S. Naval Academy | N.Y. | Irving Salem A.B. in Govt. 1957, The George Washington University | Md. |
| Stanley Marvin Lippick A.B. 1950, Columbia University | Calif. | George William Warlick B.S. in E.E. 1956, Duke University | N.C. |
| Reese Stephen Mencher A.B. in Govt. 1957, The George Washington University | D.C. | | |

OCTOBER 22, 1960

| | | | |
|---|-------|---|-------|
| Robert Frederick Alhutt B.S. in E.E. 1957, Virginia Polytechnic Institute | Va. | Julian S. Levitt B.S. 1951, College of the City of New York M.S. 1953, Kansas State College | D.C. |
| Yvonne Huguette Behart Licence en Lettres d'Anglais 1949, University of Bordeaux, France | Md. | Nancy Lou Provost A.B. 1956, Pembroke College | Conn. |
| Ralph Henry Chilton B.S. in M.E. 1952, Purdue University | Va. | Jon Sheldon Saxe B.S. in Chem.E. 1957, Carnegie Institute of Technology | D.C. |
| David Paul Cuilen B.S. in Geol.E. 1956, M.S. in C.E. 1957, Oklahoma University | Va. | Malcolm Livingston Sutherland B.S. in Chem.E. 1957, Carnegie Institute of Technology | Va. |
| George W. Star Dunaway B.S. in Chem.E. 1950, Alabama Polytechnic Institute | Texas | Robert Vernon Viethers B.M.E. 1957, General Motors Institute | Va. |
| Martin Carl Garbow B.S. 1955, Purdue University | Ill. | Albert Stanton Weaver B.S. in Chem.E. 1956, University of Wisconsin | Va. |

MASTER OF LAWS

FEBRUARY 22, 1960

| | | | |
|--|------|--|--------|
| Walter Jerome Ballinger Ph.D. 1929, Yale University LL.B. 1958, Detroit College of Law | Va. | Clifford Lawrence Wiser B.S. 1952, University of Maryland LL.B. 1958, The George Washington University | Md. |
| Paul Weatherly Garrett A.B. 1949, LL.B. 1956, The George Washington University | D.C. | Thomas R. Charles Young LL.B. 1952, The George Washington University | Calif. |
| Morton Frank Hersman B.S. 1957, Ohio State University LL.B. 1958, The George Washington University | Va. | | |

JUNE 1, 1960

| | | | |
|--|------|--|-------|
| Jerome Aure Barron A.B. 1955, Tufts University LL.B. 1958, Yale University | D.C. | Patrick Emmett Kilcoyne B.S. in Com. 1948, Louisiana State University | La. |
| James Edward Cockfield B.Sc. Eng., M.S. 1953, Ohio State University | D.C. | LL.B. 1958, Loyola University, Louisiana | Ohio |
| J.D. 1959, The George Washington University | | Cecil Thomas Lakes A.B. 1948, LL.B. 1950, University of Cincinnati | |
| Allen James Espain B.S. in Ed. 1936, A.M. 1938, Ohio State University | Va. | Robert Gerald Lauck A.B. 1949, Municipal University of Wichita LL.B. 1954, University of Kansas | Kans. |
| LL.B. 1957, Duke University | | Joseph Donald McLaughlin LL.B. 1954, Dartmouth University | D.C. |
| Dipl. in Law 1956, Cambridge University, England | | Frank Wendell Parnham A.B. 1954, Dartmouth College | Va. |
| David Robert Ficca B.S. 1957, Fordham University LL.B. 1959, Georgetown University | Pa. | J.D. 1956, The George Washington University | |
| Seamus Harris B.B.A. 1953, College of the City of New York | N.Y. | John Joseph O'Neill A.B. 1957, Ohio Wesleyan University LL.B. 1958, The George Washington University | Va. |
| J.D. 1957, The George Washington University | | | |

MASTER OF COMPARATIVE LAW

FEBRUARY 22, 1960

Belma Bayar Turkey
 A.B. 1950, American College for Girls
 A.M. 1954, Istanbul University Law School

JUNE 1, 1960

Rose Marie Sanchez Alonzo Philippines
 LL.B. 1956, Manuel L. Quezon University
 Yohannes Berhane Ethiopia
 A.B. 1952, San Bernardo University,
 Ethiopia
 Dottore in Giurisprudenza 1956, Asmara
 Scuola Di Giurisprudenza

Jose Soriano Lu Philippines
 LL.B. 1956, University of the Philippines
 George Greg Morris Scotland
 LL.B. 1959, Glasgow University

OCTOBER 22, 1960

Mario Franzosi
 Laurea in Giurisprudenza 1956, Università
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Italy Sang Ik Moon
 LL.B. 1954, Seoul University

Korea

MASTER OF COMPARATIVE LAW

(American Practice)

JUNE 1, 1960

Adam Maria Macielinski
 LL.M. 1931, Pol.Sc.M. 1934, University
 of Lwow, Poland

D.C.

STUDENTS REGISTERED IN THE LAW SCHOOL

SPRING 1959-60, SUMMER 1960, AND FALL 1960-61

A

| | | | |
|--|-------------|--|---------------|
| Abato, Anthony Albert, Jr. A.E. 1953, University of Maryland | Md. | Bahn, Ralph A.B. 1942, The George Washington University | Md. |
| Adams, Don Tisherman B.C.E. 1957, University of Florida | Va. | Baird, Robert Leo A.B. 1958, American University | D.C. |
| Addams, Nicholas A. B.S. in E.E. 1960, Newark College of Engineering | N.J. | Baker, Gerald Franklin A.B. 1948, Ed.M. 1956, Lewis and Clark College | Va. |
| Ale, Charles P. B.S. 1955, Villanova University | Ga. | Baker, Patrick C. A.B. 1956, Catholic University of America | Mich. |
| Albright, George L. B.S. 1954, Brigham Young University | Nev. | Band, David Sheldon B.S. 1958, University of Maryland | D.C. |
| Alford, William Curtis, Jr. B.S. 1956, M.B.A. 1957, American University | Md. | Banks, Peter L. Bannasch, Norma T. | D.C. Mich. |
| Allen, Dillis V. B.S. in M.E. 1960, University of Wisconsin | Ill. | Barber, John Theodore A.B. 1957, University of Michigan | N.Y. |
| Allen, Kenneth D. A.B. 1960, Central Missouri State College | Mo. | Barnes, Andrew McReynolds A.B. 1955, Middlebury College | D.C. |
| Allnutt, Robert Frederick B.S. in I.E. 1957, Virginia Polytechnic Institute | Va. | Barone, Vito S. B.Ch.E. 1960, University of Detroit | Mich. |
| Alonso, Rose Marie Sanchez LL.B. 1956, Manuel L. Quezon University | Philippines | Barriage, Joan B. B.S. in A.E. 1951, Purdue University | Va. |
| Altheide, Dorothy Paul Ph.B. 1950, University of Chicago | Md. | Barron, Jerome Aure A.B. 1955, Tufts University | Mass. |
| Alvey, Ralph Joseph B.S. 1950, University of Colorado | D.C. | LL.B. 1958, Yale University | N.Y. |
| Appelman, Geraldine A.B. 1958, University of Maryland | D.C. | Barsky, Ira Philip B.S. 1959, New York University | Va. |
| Anderson, Billy R. B.S. 1960, Brigham Young University | Wyo. | Barth, Charles A. A.B. 1952, LL.B. 1954, Indiana University | Ind. |
| Anderson, Charles T. A.B. 1958, Southern Illinois University | Fla. | Bartl, Richard Allen B.S. 1957, Purdue University | Idaho |
| Anderson, Martin A.B. 1951, M.S. 1954, The George Washington University | Md. | Baugh, Vida Marie A.B. 1950, University of Idaho | Pa. |
| Angier, Anna P. A.B. 1944, Maryville College of the Sacred Heart | Tenn. | Baynham, Robert J. B.S. in M.E. 1959, University of Pittsburgh | Va. |
| Antonelli, Donald Ralph B.S. in E.E. 1957, Purdue University | Ill. | Bean, James L. B.S. in C.E. 1950, Tennessee Polytechnic Institute | Va. |
| Antonelli, Joseph M. B.S. 1960, University of Maryland | Tenn. | Beatley, Charles Earle, Jr. A.B. 1938, M.B.A. 1947, Ohio State University | Va. |
| Armstrong, Richard V. A.B. 1958, The University of Oklahoma | Okla. | Beatman, James Winfield A.B. 1948, Oberlin College | Va. |
| Aron, Lewis Greene B.S. 1959, Brown University | R.I. | A.M. 1949, University of Pennsylvania | D.C. |
| Arrington, Paul Bradley B.S. 1959, Presbyterian College | D.C. | Beaudoin, Claude L. B.S. 1956, University of New Hampshire | Va. |
| Ashland, Calvin K. B.S. 1957, Iowa State College of Agriculture and Mechanic Arts | Iowa | Beck, Andrew Joseph B.S. 1956, Virginia Polytechnic Institute | N.Y. |
| Adelson, Robert Freeman B.S., B.B.A. 1958, University of Minnesota | Minn. | Beck, Richard M. B.M.E. 1960, Rensselaer Polytechnic Institute | Va. |
| Ammar, Charles S. B.S. 1958, Boston University | Conn. | Beck, William R. A.B. 1960, University of Miami | Md. |
| Autor, Sanford B.S. in Ch.E. 1958, Purdue University | Ind. | Becker, George Dennis A.B. 1956, Swarthmore College | Ind. |
| Aubuchon, Frank David B.S. in M.E. 1957, University of Missouri | Mo. | Becker, Roland Wayne A.B. 1958, The George Washington University | N.J. |
| Aurilio, Gerald P. B.S. 1954, Pennsylvania State University | Pa. | Beckwith, Horace Palmer A.B. 1954, Maryville College | Md. |
| Auten, Howard Leonidas B.S. in B.A. 1952, Miami University | D.C. | Beerman, Bernard Marvin A.B. 1959, Princeton University | Utah |
| Awalt, Thomas Y. B.S. 1948, Virginia Military Institute | Hawaii | Beeton, Martell B.S. 1958, Utah State University | Md. |
| Baca, Joseph F. A.B. in Ed. 1960, University of New Mexico | N.M. | Behart, Yvonne Huguette Licence es Lettres d'Anglais 1949, University of Bordeaux, France | N.Y. |
| Bagratt, William Keeffe B.S. in I.E. 1957, West Virginia University | Va. | Bell, Harry Clark B.S. 1957, Georgetown University | Va. |
| | | Bell, John T. B.S. 1959, University of Maryland | Md. |
| | | Beller, Margaret Anne A.B. 1955, A.M. 1957, The George Washington University | |

B

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|--|----------|---|-------|
| Baudere, George H. A.B. 1960, Lafayette College | N.J. | Bodolus, Carl Theodore A.B. in Govt. 1954, The George Washington University | Pa. |
| Bowen, Charles William B.S. 1955, Rutgers University | D.C. | Bohan, Jack Lee B.Met.E. 1956, Rensselaer Polytechnic Institute | Va. |
| Bentzman, Marshall Robert B.S. in B.A. 1956, American International College | Pa. | Bond, Robert T. A.B. 1954, Southern Missionary College | Md. |
| Berg, Egon Edward B.S. 1959, Rutgers University | N.J. | Bonfant, Reno Elwood A.B. 1953, University of Pittsburgh | Pa. |
| Berhane, Yohannes A.B. 1952, San Bernardo University, Ethiopia | Ethiopia | Booher, Harold R. B.S. 1960, Rose Polytechnic Institute | Ill. |
| Berzina, Louis Dottore in Giurisprudenza 1959, Università University, Ethiopia | Ethiopia | Bound, Arthur Edward, Jr. B.S. in B.A. 1953, University of Florida | Va. |
| Berkheimer, Donald Eugene B.S. 1959, University of Maryland | Md. | Boykin, Lester Junod A.B. 1946, Duke University | D.C. |
| Bernard, Hugh Yancy, Jr. A.B. 1941, University of Georgia B.S. 1947, Columbia University | Va. | Bradley, David Owen B.S. in E.E. 1958, Michigan College of Mining and Technology | Mich. |
| Bernard, Lawrence J. B.S. 1960, University of North Carolina | Md. | Brand, Joseph L. A.B. 1958, University of Michigan | Va. |
| Berneike, Richard Harris B.S. in Ch.E. 1958, Purdue University | Va. | A.M. 1959, Ohio State University | Va. |
| Berrier, Erwin F. B.S. in M.E. 1960, Purdue University | Ind. | Brannigan, Alan E. B.S. in M.E. 1959, University of Colorado | Md. |
| Berul, Lawrence Herbert B.S. in Com. 1957, Drexel Institute of Technology | Md. | Branscomb, Anne Wells A.B. 1949, Georgia State College for Women | Md. |
| Berzina, Louis B.S. 1958, Michigan College of Mining and Technology | Va. | A.M. 1950, Radcliffe College | Fla. |
| Best, Robert Eric B.B.A. 1954, University of Oklahoma | Va. | Brant, William M. A.B. 1959, University of Florida | Va. |
| Best, Stephen Lewis A.B. 1955, Kenyon College | D.C. | Braun, Howard William, Jr. A.B. 1956, Colgate University | D.C. |
| Bethers, Pratt Gordon, Jr. B.S. 1956, Brigham Young University | Utah | Breen, Martin Joseph A.B. 1952, Stanford University | D.C. |
| Betts, Carolyn B.S. 1954, North Texas State College | Va. | Brekke, Darrell Gene B.S. in E.E. 1954, South Dakota School of Mines and Technology | Md. |
| Beutler, Ernest Albert, Jr. B.S. 1957, Northwestern University | Va. | Breton, Michael Pemow B.S. in E.E. 1955, University of Maryland | Md. |
| Beuda, Cohen Richard A.B. in Govt. 1959, The George Washington University | D.C. | Brewer, Glenn M. B.S. 1955, University of Maryland | Md. |
| Bridges, Michael B.S. 1959, University of Pittsburgh | Pa. | Brezina, Edward S. M.D. 1948, University of Southern California | Iowa |
| Binn, Norman B. B.S. 1949, U. S. Coast Guard Academy | Md. | Bridgens, Burton Gearhart A.B. 1941, State University of Iowa | Mass. |
| Birch, Terrell C. B.E.E. 1959, The George Washington University | Md. | Bridgman, Alfred Fearing, Jr. B.S. 1954, U. S. Coast Guard Academy | Idaho |
| Bischoff, Clarence Gemmill B.S. 1955, Grove City College | Pa. | Broadhead, William Sherwin A.B. 1956, Idaho State College | Md. |
| Bison, Barry Gale B.S. 1956, University of New Hampshire | N.H. | Brochstein, Stanley J. B.S. 1950, Carnegie Institute of Technology | Va. |
| Bison, Gary Byron A.B. 1956, University of New Hampshire | Va. | Bronczak, Arthur Francis A.B. 1954, Maryknoll College | Md. |
| Bison, Harold Randall A.B. 1957, Michigan State University of Agriculture and Applied Science | Va. | Brown, Donald Carroll A.B. 1952, University of Vermont | Va. |
| Bison, George S. B.S. 1957, Polytechnic Institute of Brooklyn | D.C. | Brown, Dulcey A. A.B. 1957, The George Washington University | Md. |
| Bison, William V. B.S. 1957, University of Missouri | Md. | Brown, Edward W. B.S. 1959, Louisiana State University and Agricultural and Mechanical College | Nebr. |
| Bison, Charles H. Smith B.M.E. 1955, Cornell University | Va. | Brown, George F. B.S. 1955, University of Wyoming | Del. |
| Blackburn, Albert Chick A.B. 1956, Yale University | Me. | Brown, Grover Cleveland A.B. 1957, University of North Carolina | Md. |
| Black, Neal H. B.S. 1960, Temple University | Pa. | Brown, Raymond K. B.S. 1960, Mount Saint Mary's College | Kans. |
| Black, Samuel H. B.S. 1959, Brooklyn College | Md. | Brown, Sarah Eleanor A.B. 1958, Vassar College | Va. |
| Black, Lawrence T. B.S. 1955, University of Alabama | Ala. | Brown, Theodore Locke A.B. 1955, Colby College | Md. |
| Black, Daniel Corwin B.S. 1957, Texas College of Arts and Industries | Va. | Bubaker, Ronald C. B.S. in Ed. 1955, Pennsylvania State Teachers College, Indiana | Va. |
| Black, Carmen Joseph B.S. 1955, U. S. Coast Guard Academy | Va. | Bryan, David Carvel B.S. in B.A. 1955, Georgetown University | Mich. |
| Black, Russell McKay A.B. 1951, University of California | D.C. | Brvant, Willard Edward B.S.P. 1958, University of Michigan | |

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|---|-------|--|-------|
| Brzozowski, Edmund B.E.E. 1950, The George Washington University | Md. | Carlisle, Dale Louis B.S. 1951, P.A. 1957, University of Idaho | Wash. |
| Buchanan, Lee K. M.D. 1952, State University of Iowa | Md. | Carroll, Loren Merle A.B. 1951, Yankton College | Va. |
| Buck, Richard Sutton IV A.B. 1958, University of Maryland | Va. | Carroll, John B.S. 1951, Western University | Va. |
| Buff, Ralph M. A.B. 1958, Ohio University | Va. | Carter, Joseph Lester, Jr. B.S. 1951, Maryland State Teachers College, Fredsburg | Md. |
| Bullin, Melvin L. A.B. 1960, University of Maryland | Md. | Carter, Robert Henry A.B. 1951, Buchanan Young University | Md. |
| Bullock, Charles Arthur A.B. 1954, Franklin and Marshall College | Pa. | Carver, Henry S. A.B. 1951, College of William and Mary | Va. |
| Bullock, Joseph Jay B.S. 1954, Buchanan Young University | Idaho | Carvey, David C. A.B. 1951, Pennsylvania State University | D.C. |
| Bulman, Leonard Z. A.B. 1956, University of Maryland | D.C. | Carr, Edward H. B.S. 1951, University of Oklahoma | Okla. |
| Bunker, Richard Wendell B.S. 1959, Buchanan Young University | Va. | Cassey, James E. B.S. 1951, Roosevelt College | Va. |
| Burchardt, Raymond F. A.B. 1960, Kenyon College | N.J. | Cassey, Michael Thomas B.S. 1951, Georgetown University | Md. |
| Burchardt, James Ignatius B.S. 1956, Pennsylvania State University | Pa. | Castaneda, Augustine Frank B.S. 1951, Sutton Hall College | D.C. |
| Burnett, Robert Franklin B.S. 1956, Clemson Agricultural College | Va. | Catalano, Edward Michael A.B. 1951, Bowdoin College | D.C. |
| Burnett, George James A.B. 1958, Upsala College | N.J. | Catt, John A.M. 1951, Johns Hopkins University | D.C. |
| Burrows, Lawton Arthur, Jr. B.S. 1957, University of Delaware | Va. | Cavett, Susan N. B.F.E. 1951, Georgia Institute of Technology | D.C. |
| Burton, Stewart Dawson A.B. 1951, Brigham Young University | Va. | Cawick, James Will A.B. 1951, The George Washington University | Va. |
| Butler, Charles F. A.B. 1959, Boston University | D.C. | Cernato, Samuel J. B.S. 1951, Georgetown University | D.C. |
| Butovsky, David Martin A.B. 1953, Temple University | Md. | Chabrow, Leon B.S. 1951, Mahlenberg College | Pa. |
| Buras, Kenneth Antrim A.B. 1955, Colorado State College of Education | Colo. | Chamberlain, Marion Kay A.B. 1951, West Virginia University | Va. |
| A.M. in Govt. 1943, The George Washington University | | Chandler, George P. B.S. 1951, University of Tennessee | Md. |
| C | | | |
| Cacchillo, Anthony Francis B.S. 1953, University of Connecticut | Conn. | Chandler, Nori Andrew B.S. 1951, Georgetown University | D.C. |
| Cacchillo, Frank B.S. 1947, University of Notre Dame | Va. | Charlton, Walter Theodore B.S. 1952, University of Maryland | D.C. |
| Cachery, James Chris B.S. 1955, University of Pennsylvania | D.C. | Chen, W. John Dickerson B.S. 1951, University of Maryland | Md. |
| Cahill, Robert Allen B.S. 1951, University of Wisconsin | Wis. | Chase, Stephen E. A.B. 1951, The George Washington University | Md. |
| Cahill, William Charles B.E.E. 1955, B.M.E. 1956, University of Akron | Va. | Chee, Clarence H. B.S. 1951, Georgetown University | Korea |
| Callahan, Herbert A. A.B. 1955, University of North Carolina | Md. | Cherow, Alan William B.S. 1951, New England College | Vt. |
| Calloway, James Richard A.B. 1959, The George Washington University | Del. | Chess, Richard Benjamin, Jr. A.B. 1951, Tufts University | Va. |
| Campbell, Barbara L.L.B. 1959, The George Washington University | Va. | Chesser, Richard Harvey B.S. 1951, U.S. Naval Academy | Jl. |
| Campbell, Donald Eugene A.B. 1959, The George Washington University | D.C. | Chesser, Robert Henry B.S. in M.E. 1952, Purdue University | Va. |
| Campbell, Edward A. B.S. in E.E. 1959, Evansville College | Ind. | Christensen, Gordon A. B.S. 1955, L.L.B. 1956, University of Utah | Va. |
| Campbell, James B.S. in E.E. 1956, University of Colorado | Va. | Church, Lawrence Brhart A.B. 1951, The George Washington University | Va. |
| Canfield, Lawrence R. B.S. 1956, University of Arizona | Va. | Clairmont, John A. A.B. 1951, University of Rochester | N.Y. |
| Cand, Albert Philip B.S. in E.E. 1959, University of Missouri | D.C. | Clancy, John A.B. 1951, University of Pittsburgh | Va. |
| Canine, Thomas Yellott, Jr. A.B. 1952, University of Virginia | Md. | Clark, Barry Loumas B.S. 1951, M.E. 1956, Northwestern Technical Institute | Va. |
| Caplan, Donald Marvin B.S. 1954, University of Maryland | Md. | Clark, David Arthur A.B. 1951, University of Washington | Wash. |
| Capompoli, Joseph S. B.B.A. 1957, Marshall College | D.C. | Clark, Robert E. A.B. 1951, Harvard University | Pa. |
| Capou, Anna Joyce A.B. 1957, The George Washington University | D.C. | Clatterback, Dean S. A.B. in Govt. 1960, The George Washington University | D.C. |
| | | Clawson, Marvin L. A.B. 1951, Michigan State University of Agriculture and Applied Science | Mich. |
| | | Clemons, Thomas Akroed, Jr. B.S. 1951, U.S. Coast Guard Academy | Md. |

| | | | |
|--|--------|--|-------|
| Cobb, Alan Elmer | D.C. | Cowley, Samuel Parkinson | D.C. |
| B.S. 1934, Bowling Green State University | | B.S. 1939, University of Utah | |
| Cobbs, James A. | Md. | Cox, Henry Bartholomew | D.C. |
| B.S. 1958, Florida State University | | A.B. 1959, Princeton University | Va. |
| Coble, Paul Maxwell | Md. | Cox, William Edward | |
| B.S. 1957, M.S. 1958, Massachusetts | | A.B. 1954, Bucknell University | Md. |
| Institute of Technology | | Coxen, Edward D. | |
| Cockfield, James Edward | D.C. | A.B. 1960, The George Washington | |
| B.Pet.E., M.S. 1953, Ohio State University | | University | Va. |
| J.D. 1959, The George Washington | | Craig, John David | |
| University | | A.B. 1957, Indiana University | D.C. |
| Cocks, Kenneth Alfred | Texas | Cramer, Richard Benjamin | |
| B.S. in I.E. 1959, Washington University | | A.B. 1959, University of Michigan | N.J. |
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| B.S. 1957, University of Arizona | | A.B. 1958, Colgate University | Md. |
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| B.S. 1955, Northwestern University | | B.S. 1958, Washington and Lee University | Va. |
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| B.S. in M.E. 1958, University of Michigan | | B.S. 1954, St. Peter's College | Ga. |
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| Institute | | A.B. 1937, West Virginia Institute of | |
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| of Technology | | Crawford, Robert Jerry | |
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| B.S. 1955, U. S. Naval Academy | | B.S. 1957, University of Utah | Mass. |
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| B.S. 1956, Oklahoma State University of | | B.S. 1952, Boston College | Va. |
| Agriculture and Applied Science | | Criddle, Byron Dean | |
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| B.S. in E.E. 1953, University of Missouri | | Agriculture and Applied Science | Va. |
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| Haase, Mark W. | Ill. |
| A.B. 1960, Washington and Lee University | |
| Hagen, Gordon Holte | D.C. |
| A.B. 1957, St. Olaf College | |
| Hagenlock, Raymond Ernest | D.C. |
| A.B. 1957, Syracuse University | |
| Haines, Dennis | Ohio |
| B.S.C. 1959, Ohio University | |
| Hall, Alfred E. | Md. |
| B.S. 1956, Montana State College | |
| Hall, Blair Parks | Md. |
| A.B. 1952, University of Maryland | |
| Hall, Charles S. | Md. |
| A.B. 1930, McKendree College | |
| L.L.B. 1953, Wayne University | |
| Hall, Henry Lyon, Jr. | Va. |
| A.B. 1953, University of Massachusetts | |
| Hall, Jack Herbert | Va. |
| B.Ch.E. 1957, Rensselaer Polytechnic Institute | |
| Hall, John F. | D.C. |
| B.S. 1959, Pennsylvania State University | |
| Hall, Ned | D.C. |
| B.S. 1959, D. C. Teachers College | |
| Hallacher, Lester L. | Pa. |
| B.S. 1959, Pennsylvania State University | |
| Haller, Theodore R. | Va. |
| B.S. 1960, Pennsylvania State University | |
| Halper, John B. | D.C. |
| B.S. 1946, A.M. 1947, Columbia University | |
| Halvorsen, Ronald M. | Va. |
| B.S. in C.E. 1957, Drexel Institute of Technology | |
| Hambleton, Neal | Del. |
| A.B. 1956, University of Delaware | |
| Hamburg, Charles B. | N.Y. |
| B.Ch.E. 1960, Polytechnic Institute of Brooklyn | |
| Hamel, Reginald Stanley | N.C. |
| A.B. 1954, Duke University | |
| Hamill, James John | Va. |
| B.M.E. 1957, Georgia Institute of Technology | |
| Hamilton, Clyde Henry, Jr. | S.C. |
| B.S. 1956, Wofford College | |
| Hamilton, John Colvin, Jr. | Va. |
| A.B. 1954, Duke University | |
| Hanaumi, Abraham A. | Hawaii |
| A.B. 1958, University of Hawaii | |
| Hando, John A. | W.Va. |
| A.B. 1958, West Virginia University | |
| Hanna, Warren Lee | Colo. |
| A.B. 1955, Washington University | |

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| Hendriksen, Leah Kiratina | D.C. | Howk, Philip Churchill | Pa. |
| B.S. 1932, M.S. 1953, University of Michigan | | A.B. 1959, College of William and Mary | |
| A.M. 1936, Columbia University | Calif. | Hubbard, Robert R. | Va. |
| Hendrix, Frederick Perry | | B.L.E. 1960, Ohio State University | |
| A.B. 1957, University of California | Md. | Hubbel, Carter Carol, Jr. | Md. |
| Herink, LaVerne Dale | | A.B. 1959, University of Maryland | |
| B.S. 1952, Iowa State College of Agriculture | | Hudson, Edward Gerard | Maine |
| and Mechanic Arts | | B.S. 1937, Bowdoin College | |
| Hertz, Harvey Sander | Va. | L.L.B. 1947, LL.M. 1950, Georgetown | |
| B.S. 1953, University of Colorado | | University | |
| Hea, Robert Walter | D.C. | M.S. in L.S. 1956, Catholic University of | |
| A.B. 1957, University of Michigan | | America | |
| Higon, Kenneth James | Canada | Hudson, Thomas L. | Ohio |
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| Hilberg, Frank Clarence, Jr. | Del. | Hughes, James Hope | Okla. |
| A.B. 1956, University of Virginia | | B.S. in M.E. 1948, University of Oklahoma | |
| Hill, James T. | Md. | Hughes, Richard D. | Idaho |
| B.S. 1951, University of New Hampshire | | A.B. 1959, University of Idaho | |
| Hillings, Edward Joseph | Calif. | Hulen, James R. | Va. |
| A.B. 1959, University of Southern California | | B.S. in M.E. 1958, University of Missouri | |
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| B.S. 1960, Wilkes College | | A.B. 1959, The George Washington | |
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| A.B. 1959, University of Wichita | | Humphries, Nathaniel A. | S.C. |
| Hinds, William Ray | S.C. | B.S. in M.E. 1950, University of South | |
| B.M.E. 1956, Alabama Polytechnic Institute | | Carolina | |
| Hinkle, James Allan | Va. | B.S. in Met. 1958, University of Utah | |
| B.E.E. 1957, University of Virginia | | Hundley, Charles C. | Va. |
| Honman, Gerald G. | Md. | B.S. 1959, Richmond Professional Institute | |
| B.S. 1938, U. S. Naval Academy | | Hunter, Thomas Brandon | Va. |
| Hittson, Charles H. | Ohio | B.S. in C.E. 1956, Case Institute of | |
| B.S. in M.E. 1960, Ohio University | | Technology | |
| Hochhauser, Stanley Manuel | N.Y. | Huntington, Lawrence Smith | N.Y. |
| A.B. 1958, Brooklyn College | | A.B. 1957, Harvard University | |
| Hochman, William | N.J. | Husting, Stephen Steidinger | Va. |
| A.B. 1956, Indiana University | | B.S. in M.E. 1954, Purdue University | |
| Hodgson, Albert Carveth | Va. | Hutchison, Alan David | N.Y. |
| B.S. 1957, Virginia Polytechnic Institute | | B.S. in B.A. 1956, Ohio State University | |
| Hoemeke, Robert B. | Mo. | Hvde, Herbert Kenneth, Jr. | Okla. |
| B.S. 1957, St. Louis University | | A.B. 1955, University of Oklahoma | |
| Hoffman, Martin P. | N.J. | | |
| B.S. in M.E. 1960, Newark College of | | I | |
| Engineering | | Isakov, Peter | Ohio |
| Holcombe, John Howard | Ill. | Ch.E. 1958, University of Cincinnati | |
| B.S. 1959, Iowa State Teachers College | | J | |
| Hollon, Dan Sherwin | Va. | Jabas, Florian Harley | Wis. |
| A.B. 1949, American University | | B.S. 1957, University of Wisconsin | |
| A.M. 1950, Columbia University | | Jackel, Earl Howard | N.Y. |
| Holmes, Ralph Albion, Jr. | Va. | A.B. 1959, Bard College | |
| B.S. 1947, University of Maryland | | Jackson, John David | Va. |
| L.L.B. 1950, University of Virginia | | B.S. 1958, University of Maryland | |
| Holt, William H. | D.C. | Jackson, Richard Kay | D.C. |
| B.S. in Eng. 1957, The George Washington | | B.S. 1957, Iowa State College of Agriculture | |
| University | | and Mechanic Arts | |
| Holtzer, James Anthony | Pa. | Jacobs, Kenneth Elmer | W.Va. |
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| University | | Jacobs, Marvin E. | Va. |
| Honeycutt, Gary Clark | Va. | B.S. in Ch.E. 1959, Drexel Institute of | |
| B.S. 1954, University of Arkansas | | Technology | |
| Hoolnarde, Joseph Bruce, Jr. | Va. | Jacobsen, Bernice H. | D.C. |
| B.S. 1958, Virginia Polytechnic Institute | | B.E. 1937, Wisconsin State College | |
| Hopkins, Charles T. | Idaho | A.M. in Govt. 1954, The George | |
| A.B. 1960, Stanford University | | Washington University | |
| Horgan, James Joseph | Del. | Jagger, Bruce Anderson | Wyo. |
| B.S. 1957, LaSalle College | | B.S. in Ch.E. 1957, The University of | |
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| A.B. in Govt. 1958, The George Washington | | Jamborsky, Richard Julius | Tenn. |
| University | | A.B. 1958, The George Washington | |
| Horton, Corwin Ray | Oreg. | University | |
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| Hoerner, Howard, Jr. | D.C. | B.S. 1949, The George Washington | |
| A.B. 1954, Pennsylvania State University | | University | |
| Houston, James John | Pa. | Jastrom, Harold Dudley | S.D. |
| B.S. 1954, University of Scranton | | B.S. in E.E. 1957, South Dakota State | |
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| University | | Jeffers, Donald Dyer | Va. |
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| A.B. 1958, Wabash College | | Jeffery, Joseph Daniel | Colo. |
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| B.S. in Ch.E. 1959, University of Cincinnati | | | |

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| A.B. 1951, University of Pittsburgh | | Kempl, Robert Frederick | Va. |
| M.S. 1952, University of Denver | | B.S. in E.E. 1952, University of Massachusetts | Va. |
| Jennings, Richard M. | Va. | Kennedy, John Edward | |
| B.S. in E.E. 1960, Kansas State University | | A.B. 1947, Boston College | Md. |
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| LL.B. 1955, University of Idaho | | Kenney, Joseph Ernest | |
| LL.M. 1956, Columbia University | | B.S. in M.E. 1956, University of | |
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| B.S. 1956, Brooklyn College | | Kennington, Charles R., Jr. | |
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| University | | A.M. 1960, Tufts University | |
| Johnson, David William | N.Y. | LL.B. 1953, Georgetown University | |
| B.S. 1952, Brooklyn College | | LL.M. 1954, Harvard University | Va. |
| Johnson, Irving M. | D.C. | Kern, Lillian M. | |
| B.S. 1959, University of Washington | | A.B. 1951, University of Miami | D.C. |
| Johnson, Jonathan E. | D.C. | Kern, Paul B., Jr. | |
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| University | | Keeler, Vibert L., Jr. | |
| Johnson, Raymond Eric | N.Y. | B.S. 1960, University of Utah | Mich. |
| B.C.E. 1958, Rensselaer Polytechnic Institute | | Keston, Sanford Miller | |
| Johnson, Robert Alfred | D.C. | A.B. 1957, University of Michigan | Va. |
| B.S. 1950, Ohio State University | | Ketcham, John Tyden | |
| M.S. 1956, Colorado School of Mines | | A.B. in Govt. 1958, The George Washington | |
| Johnson, Rodger Allyn | Ill. | University | Pa. |
| B.S. 1957, University of Illinois | | Kidda, Bernard George | |
| Johnson, Vernon Webster, Jr. | Md. | B.S. 1958, Pennsylvania State University | Pa. |
| A.B. 1956, Duke University | | Kieser, Henry S. | La. |
| Johnston, Herbert R., Jr. | N.Y. | B.E. 1960, Yale University | |
| A.B. 1959, Cornell University | | Kilcoyne, Patrick Emmett | |
| Jones, Alon Rodell | Md. | B.S. in Com. 1948, Louisiana State | |
| A.B. 1951, Temple University | | University | |
| Jones, Charles Sherfy | Md. | LL.B. 1958, Loyola University | Va. |
| B.S. 1953, Duke University | | King, George William | |
| Jones, David DeBellis | Pa. | B.S. in M.E. 1957, West Virginia University | Va. |
| A.B. 1958, Pennsylvania State University | | King, James R. | |
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| B.S. 1957, Yale University | | King, William Houston | |
| Jordon, Gary Lynn | Kans. | B.S. in E.E. 1950, University of Kentucky | Ohio |
| B.S. in Ch.E. 1958, University of Kansas | | Kinney, Robert G. | |
| Jordon, Phil Winburn | Md. | A.B. 1960, Ohio University | Calif. |
| B.S.C. 1935, University of Georgia | | Kinney, Sheldon Hoard | |
| Josephson, Diana H. | D.C. | B.S. 1941, U. S. Naval Academy | Mass. |
| A.B. 1958, Somerville College | | Kinville, Robert M. | |
| Joyce, Kevin Edward | Maine | B.S. 1958, Northeastern University | D.C. |
| B.S. 1956, Worcester Polytechnic Institute | | Kirchman, Charles Vincent | |
| Juhász, Andrew Richard | Md. | A.B. 1959, University of Maryland | D.C. |
| B.S. 1949, University of Buffalo | | Kirkpatrick, Thomas Healy | |
| | | B.S. 1958, University of Oregon | Md. |
| | | Klauber, Stefan Jay | |
| | | A.B. 1955, Cornell University | Va. |
| | | Klein, Melvin A. | |
| | | B.S. 1956, U. S. Naval Academy | D.C. |
| Kahn, Stuart | N.J. | Klooz, Marie Stuart | |
| A.B. 1957, Indiana University | | A.B. 1923, Sweet Briar College | |
| Kamp, Ronald C. | Ill. | A.M. 1939, Columbia University | Va. |
| B.S. 1956, University of Illinois | | Knechtel, Robert G. | |
| Kapfer, Andrew J. | Conn. | A.B. 1958, Cornell University | D.C. |
| B.S. 1958, University of Connecticut | | Kneipp, Robert Frederick | |
| Karp, Arnold Lewis | Md. | A.B. 1935, Duke University | Va. |
| A.B. 1954, University of Maryland | | Knowles, Allen Nordmark | |
| Kastriner, Lawrence George | Va. | B.S. in M.E. 1955, Iowa State College of | |
| A.B. 1954, B.S. 1955, M.S. 1959, Columbia | | Agriculture and Mechanic Arts | Va. |
| University | | Kudson, James E. | |
| Katz, Sylvan L. | D.C. | A.B. 1960, Brigham Young University | D.C. |
| B.S. 1943, University of Maryland | | Koch, John Arthur | |
| Kauffman, Roscoe Craig | Pa. | B.I.E. 1954, Ohio State University | Iowa |
| B.S. 1958, Pennsylvania State University | | Koehn, William J. | |
| Kaul, Donald Allen | Ohio | A.B. 1958, State University of Iowa | N.Y. |
| B.M.E. 1958, Ohio State University | | Koenig, Carl Stuart | |
| Kaye, Harvey | Va. | B.S. 1959, Rensselaer Polytechnic Institute | |
| B.S. 1956, Lowell Technological Institute | | | |

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| Kohn, Janet Goldrich A.B. 1931, Antioch College | D.C. | Lang, William Adams A.B. in Govt. 1954, The George Washington University | Va. |
| Kolach, Joseph A. B.S. 1955, LL.B. 1960, University of Missouri | Va. | Langston, Jay Calvin, Jr. B.S. 1957, Montana State College | D.C. |
| Kondracki, Edward John B.S. in E.E. 1959, Newark College of Engineering | Va. | LaPrade, John Christian B.S. in Ch.E. 1957, New Mexico College of Agriculture and Mechanic Arts | Va. |
| Kora, Philip B.S.S. 1950, College of the City of New York | D.C. | Larcher, Earl Lynn B.S. 1957, Utah State Agricultural College | Utah |
| Koussas, George Anest A.B. 1954, The George Washington University | D.C. | Larsen, Kent W. A.B. 1960, University of Utah | Utah |
| Kovac, Michael B.S. 1959, Washington University | Va. | Larson, John Monk A.B. 1958, Washington and Lee University | D.C. |
| Kovell, Stanley Paul B.S. in Ch.E. 1955, Northeastern University | Va. | LaRue, Adrian B.S. 1956, Virginia Polytechnic Institute | Md. |
| Kovin, John Fred A.B. 1958, Washington Missionary College | Va. | Latimer, Edwin P. B.S. 1959, University of Maryland | D.C. |
| Kraemer, John R. A.B. 1960, Georgetown University | Va. | Latshaw, Betty J. B.B.A. 1959, University of Oklahoma | Va. |
| Krichman, Jack B.S. 1948, College of the City of New York | Md. | Lauch, Robert Gerald A.B. 1949, University of Wichita | Kans. |
| Kraus, Charles K. B.S. 1956, Georgetown University | Va. | Lawson, Julian Paul LL.B. 1954, University of Kansas | Md. |
| Krawiec, Martin M. B.S. 1958, Cornell University | N.Y. | Leatherman, Stanley J. A.B. 1957, Taylor University | Ind. |
| Krebs, Henry C. A.B. in Govt. 1949, The George Washington University | D.C. | Leavitt, Alfred Lewis B.S. in Ch.E. 1957, Oregon State College | Oreg. |
| Kregg, John B.S. 1953, LL.B. 1958, Wayne State University | Va. | Lee, James Bracken B.S. 1952, U. S. Military Academy | Utah |
| Krishna, Somanahally Malliah LL.B. 1955, Bangalore Government Law School, India | India | Leiner, Charles Philip B.S. 1951, San Diego State College | Md. |
| M.C.L. 1959, Southern Methodist University | Va. | Leitner, Saul B.M.E. 1959, Polytechnic Institute of Brooklyn | D.C. |
| Kruger, Charles L. A.B. 1956, University of Michigan | D.C. | Leon, Bernard Samuel A.B. 1951, New York University | N.Y. |
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| Kumlos, Harold Andrews A.B. 1949, University of Washington | Wash. | Lepchinsky, Charles Richard B.E.E. 1957, The George Washington University | Pa. |
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| La Bonte, Clarence Victor, Jr. A.B. 1958, Cornell University | Mam. | Leppink, James A. B.S. 1957, University of Wyoming | Va. |
| Labovaki, Joseph B.S. 1956, Pennsylvania State University | Pa. | Lerch, Harry Walter A.B. 1959, Wesleyan University | Md. |
| LaBran, Ronald M. B.S. 1958, University of Pennsylvania | Va. | Leslie, David Ellis B.S. 1957, California State Polytechnic College | Calif. |
| Lahr, Jack L. B.S. in M.E. 1956, University of Toledo | Va. | Lettenberger, Peter J. B.S. 1959, Marquette University | Wis. |
| Laiche, Calvin B.S. 1954, Louisiana State University | D.C. | Levin, Stanley A.B. 1949, Yeshiva University | Md. |
| Lake, Cecil Thomas A.B. 1948, LL.B. 1950, University of Cincinnati | D.C. | Levine, Aaron M. A.B. 1958, Brooklyn College | D.C. |
| Lamb, Owen Lester B.E.E. 1956, Rensselaer Polytechnic Institute | Ohio | Levine, Herbert B.S. 1947, Brooklyn College | D.C. |
| Lamb, Roberta A.B. 1957, Simpson College | N.Y. | Levine, Morton H. B.S. 1960, American University | Va. |
| Lambe, James M. A.B. 1959, Montana State University | Iowa | Levinson, Alan Marvin A.B. 1955, Cornell University | Va. |
| Lampe, Thomas R. B.S. in I.E. 1959, Iowa State University of Science and Technology | Md. | Levison, Floyd Stern B.S. 1957, U. S. Merchant Marine Academy | D.C. |
| Lampshire, George Elwood B.S. 1952, Haverford College | Md. | Levitt, Julian S. B.S. 1951, College of the City of New York | D.C. |
| Landman, Charles H. B.S. 1960, Rutgers University | N.J. | M.S. 1953, Kansas State College of Agriculture and Applied Science | Pa. |
| Lane, Anthony Thomas B.E.E. 1957, The George Washington University | Va. | Levitz, Saylor L. B.S. 1956, Pennsylvania State University | Va. |
| | | Levy, Earl B.E.E. 1952, Rensselaer Polytechnic Institute | D.C. |
| | | Lewis, Ansel W., Jr. B.S. 1959, South Dakota School of Mines | Va. |
| | | Lewis, Edward G. B.S. 1956, Michigan College of Mining and Technology | Del. |
| | | Lewis, Eric Karl A.B. 1955, University of Rochester | |

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| Lewis, Robert E. A.B. 1956, University of Chattanooga | D.C. | Mann, William A. A.B. 1939, University of Texas | Texas |
| Lewis, Samuel Harris A.B. 1959, Cornell University | Del. | M.B.A. 1950, University of Kansas | |
| Lias, Thomas Lee A.B. 1956, State University of Iowa | Iowa | LL.B. 1956, The George Washington University | Iowa |
| Liegel, Robert Gordon B.S. 1955, Syracuse University | N.Y. | Manning, John Raymond B.S. in Eng. 1957, The George Washington University | Nev. |
| Lindrooth, Charles Hutchinson B.S. 1956, University of Illinois | Ill. | Manoukian, Milton A.B. 1957, University of Nevada | Va. |
| Llewellyn, James M., Jr. B.S. in A.E. 1956, St. Louis University | Ark. | Mansur, Jean B.S. 1946, University of Kansas | Nev. |
| Lochte, Albert J., Jr. B.S. 1957, University of Maryland | Md. | Marfisi, Philip Michael A.B. 1957, University of Nevada | Pa. |
| Loepp, Marie Therese A.B. 1951, State University of Iowa | Iowa | Margolis, Lawrence Stanley B.S. in M.E. 1957, Drexel Institute of Technology | N.Y. |
| Long, Stefan C. A.B. 1960, Roanoke College | Va. | Marin, Louis B.B.A. 1957, College of the City of New York | Conn. |
| Longest, Robert E. B.S. in E.E. 1958, Purdue University | Ind. | M.B.A. 1959, Cornell University | |
| Lotz, William E. B.S. 1947, A.M. 1949, University of Oregon Ph.D. 1957, University of Tennessee | Md. | Marinaccio, Charles Lindbergh A.B. 1957, University of Connecticut | Md. |
| Lourie, Leonard Levy A.B. 1942, Miami University | Md. | Marlo, George Joseph B.S. 1956, Pennsylvania State University | Md. |
| Love, James William B.A.E. 1950, Catholic University of America | Va. | Marmar, Melvin E. B.S. 1955, M.B.A. 1957, University of Maryland | Wis. |
| Lowe, Allan Matthew B.S. 1956, University of Maryland | D.C. | Marquardt, Merritt Reno B.S. 1956, University of Wisconsin | Va. |
| Lubitz, Stuart B.I.E. 1957, B.M.E. 1958, University of Florida | Fla. | Marrero, Robert A.B. 1958, The George Washington University | Va. |
| Lucas, Charles D. B.S. 1960, Polytechnic Institute of Brooklyn | N.Y. | Marsh, Luther Arnold A.B. 1951, University of North Carolina | Wis. |
| Luellman, Charles Gailord A.B. 1952, LL.B. 1958, University of Nebraska | Nebr. | Martens, Don W. B.S. 1957, University of Wisconsin | N.C. |
| Lynch, Robert E., Jr. A.B. 1956, University of Maryland | D.C. | Martin, James Edwin, Jr. A.B. 1957, University of North Carolina | Pa. |
| Lyne, Robert Chamberlayne, Jr. B.S. 1958, North Carolina State College | Va. | Martin, John C., Jr. A.B. 1960, University of Delaware | Va. |
| Lyons, John C. A.B. 1956, University of Rhode Island | Va. | Martina, Joseph F. A.B. 1960, Montana State University | Va. |
| Lyons, Joseph S. B.S. 1958, Mississippi Southern College | D.C. | Martine, Chester Earl, Jr. B.M.E. 1958, Rensselaer Polytechnic Institute | N.C. |
| M | | | |
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| Macielinski, Adam Maria LL.M. 1931, M.Pol.Sc. 1934, University of Lwow, Poland | D.C. | Masters, Elizabeth Ann Hough A.B. 1957, Cornell University | Texas |
| Mackiewicz, John Jacob B.Ch.E. 1957, Yale University | D.C. | Matthews, Marvin F. A.B. 1957, University of Rochester | |
| MacNaughton, Marcia Jean A.B. 1956, Columbia University | Va. | LL.B. 1960, American University | Va. |
| Madden, Richard Leo B.S. 1956, Indiana University | Va. | Matthews, Samuel Sheridan B.S. 1955, The George Washington University | Va. |
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| Madsen, Lowell LeRoy B.S. 1954, Brigham Young University | Utah | Matzureff, George Dimitroff A.B. 1954, University of Illinois | Pa. |
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| Main, Philip David A.B. 1958, Bates College | Conn. | May, Raymond U., Jr. B.E.S. 1957, Johns Hopkins University | Md. |
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| Malone, Dana Bradford A.B. 1938, Harvard University | Mass. | McBay, Wilbur L. B.S. in M.E. 1960, University of Missouri | D.C. |
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| | | McClelland, Charles Irvin B.S. 1955, Virginia Military Institute | Texas |
| | | McClendon, Frank Lemuel, Jr. B.S. 1958, University of Texas | N.C. |
| | | McConnell, Daniel E. B.S. in M.E. 1960, Duke University | Md. |
| | | McCormack, John Joseph B.S. 1954, Boston College | Ariz. |
| | | McCormick, James Carlos A.B. 1958, University of Arizona | |

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| McDermott, Edwin Floyd A.B. 1951, Denison University | Ohio | Miller, Stephen A.B. 1959, Michigan State University of Agriculture and Applied Science | Mass. |
| McDermott, Patricia Louise A.B. 1958, Idaho State College | Idaho | Milstead, Jerry Bennett B.S. in E.E. 1957, Virginia Polytechnic Institute | Va. |
| McDonnell, Robert John B.S. 1958, Drexel Institute of Technology | Pa. | Mish, Joseph J. B.S. 1960, University of Maryland | N.Y. |
| McDowell, William Woods, Jr. B.S. 1953, Johns Hopkins University | Md. | Mitchell, Charles Reese B.S. 1951, University of Alabama | Ala. |
| McElhaney, Matthew Kenneth A.B. 1954, Thiel College | Va. | Mitchell, George Charles B.S. 1941, Nebraska State Teachers College, Kearney | D.C. |
| McEniry, Mary Alice B.S. 1942, University of Alabama | Va. | A.M. 1947, Georgetown University | Nebr. |
| McGehee, Travis Shaw B.S. 1956, Texas College of Arts and Industries | Md. | Mitchell, George W. A.B. 1957, Howard University | |
| McGeheey, Marion A. B.S. 1945, Central Normal College | Va. | Mitchell, Robert L. B.S. 1959, University of Maryland | Md. |
| M.S. 1947, Butler University | | Molitch, Matthew T. B.S. 1957, New York University | Md. |
| Ed.D. 1953, Indiana University | D.C. | Monahan, Thomas Hugh B.S. 1956, Richmond Professional Institute | Va. |
| McGill, Lawrence H. A.B. 1950, American University | | Montgomery, Larry D. A.B. 1960, Southwestern College | Kans. |
| A.M. 1959, Georgetown University | Md. | Moody, Clifford Johnson A.B. 1958, University of New Hampshire | Va. |
| McKay, Cameron Lawrence A.B. 1959, University of Maryland | D.C. | Moore, Donald L. A.B. 1960, University of Maine | Maine |
| McKee, Elmer J., Jr. A.B. 1960, Gettysburg College | Va. | Moon, Sang Ik LL.B. 1954, Seoul National University, Korea | Korea |
| McKenzie, Michael Edward A.B. 1959, Dartmouth College | D.C. | Moore, Gerald Lee B.S. in E.E. 1953, Rose Polytechnic Institute | Md. |
| McLaughlin, Joseph Donald LL.B. 1941, National University | Ill. | Moore, James S. A.B. 1958, Pennsylvania State University | D.C. |
| McLear, Robert L. B.S. 1959, University of Arizona | Ohio | Moore, John C. A.B. 1954, University of Texas | Texas |
| McNevin, James Hunter A.B. 1956, Miami University | Va. | Moore, Malcolm L. B.S. in M.E. 1953, Purdue University | Md. |
| Meade, Cecil Paul A.B. 1957, University of Nebraska | Iowa | Moore, Robert Eugene B.S. in B.A. 1958, University of South Dakota | Va. |
| Means, Robert C. B.S. 1960, Iowa State College of Agriculture and Mechanic Arts | Va. | Moran, Andrew J. A.B. 1953, St. John's College | D.C. |
| Mele, Angelo J. B.A. in Eng. 1958, State University of New York | Va. | Moran, Frank W., Jr. B.S. 1960, Georgetown University | N.H. |
| Meller, Michael Nicholas B.Ch.E. 1957, Pratt Institute | D.C. | Moran, Winnifred Mary B.S. 1940, University of New Hampshire | D.C. |
| Mencher, Bruce Stephen A.B. in Govt. 1957, The George Washington University | Md. | Morenoff, Jerome A.B. 1958, B.S. 1959, M.S. 1960, Columbia University | Va. |
| Mentis, George Alexander B.S. 1947, Loyola University | Wis. | Moring, John Frederick B.S. in I.E. 1957, Virginia Polytechnic Institute | Scotland |
| Merkel, David R. B.S. 1959, University of Wisconsin | Pa. | Morris, George Greg LL.B. 1959, University of Glasgow, Scotland | D.C. |
| Merris, Edward John B.S. 1953, Pennsylvania State University | Md. | Morris, Ronald David B.S. 1955, University of Tennessee | N.M. |
| Merris, Lewis R. B.S. 1955, Pennsylvania State Teachers College, Bloomsburg | Mich. | Morrison, Robert L. B.S. 1956, Agricultural and Technical College of North Carolina | Va. |
| Merris, Albert Thomas B.S. 1951, University of Maryland | N.Y. | Morse, Wayne Allen, Jr. B.S. in E.A. 1948, University of Kansas | |
| Meth, Alex, Jr. B.S.E., Met.E., Ch.E. 1949, University of Michigan | Va. | B.S. in Ed. 1949, Kansas State Teachers College, Emporia | Idaho |
| Michals, Stanley A.B. 1959, Cornell University | D.C. | Moss, Reed L. A.B. 1957, Brigham Young University | D.C. |
| Michell, William Alexander, Jr. B.S. 1954, Pennsylvania State University | Va. | Mossinghoff, Gerald Joseph B.S. 1957, St. Louis University | Va. |
| Mick, Tim Richard B.S.E. 1959, Vanderbilt University | Pa. | Motsko, Donald Russell B.S. 1957, Pennsylvania State University | D.C. |
| Milard, James Judson B.S. 1953, Georgetown University | Fla. | Moucha, Louis Anton B.S. in E.E. 1950, University of Connecticut | |
| Miler, Burdall Dunham M.S. 1945, Albright College | Va. | M.S. in E.E. 1952, Lehigh University | D.C. |
| M.S. 1953, Ohio State University | Md. | Muhlenberg, David Stoddard A.B. 1952, Williams College | |
| Miler, Jack H. B.A. 1960, University of Miami | D.C. | B.S. in M.E. 1952, Massachusetts Institute of Technology | Ill. |
| Miler, John T. B.A. 1957, East Tennessee State College | D.C. | Mulholland, John Herbert B.S. 1957, University of Illinois | D.C. |
| Miler, Lawrence O. B.S. 1954, University of Maryland | D.C. | Mullally, John Joseph B.S. 1954, Georgetown University | W.Va. |
| Miler, Robert Jay B.S. 1957, Pennsylvania State University | Calif. | Mullins, Dennis P. A.B. 1959, Columbia University | |
| Miler, Ronald Jack A.B. 1958, The Citadel | | | |
| Miler, Roy B.S. in M.E. 1956, University of Washington | | | |

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| A.B. 1945, Hamline University | | B.S. 1957, University of Pittsburgh | |
| Mullins, John Joseph, Jr. | Mass. | O | |
| B.S.E. 1956, University of Connecticut | | | |
| Multer, Richard Duane | Colo. | Oberhouser, Louis B., Jr. | Iowa |
| B.S. in M.E. 1956, University of Colorado | | B.S. in Ch.E. 1956, Iowa State College of | |
| Munnis, David Verne | Va. | Agriculture and Mechanic Arts | Ind. |
| B.S. 1959, University of Illinois | | O'Brien, John | Mo. |
| Munro, Sanford Sterling, Jr. | Wash. | B.S. 1959, Purdue University | |
| A.B. 1957, The George Washington | | O'Connell, Michael E. | Hawaii |
| University | | B.S. 1960, University of Maryland | |
| Murphy, Edward Dennis | Va. | O'Connor, Dennis C. W. | N.J. |
| B.S. 1959, University of Notre Dame | | B.S. 1952, U. S. Naval Academy | |
| Murphy, Joseph Patrick | Va. | O'Connor, Richard T. | Va. |
| A.B. 1949, LL.B. 1950, LL.M. 1952, The | | A.B. 1956, New Jersey State Teachers | Pa. |
| George Washington University | | College, Montclair | |
| Murray, James Glick | Md. | O'Connor, Sylvia L. | Va. |
| B.S. in M.E. 1948, University of Maryland | | B.S. 1952, Simmons College | Pa. |
| B.E.E. 1956, The George Washington | | Oddi, Archie Samuel | |
| University | | B.S. in E.E. 1958, Carnegie Institute of | Va. |
| Murray, John Patrick | D.C. | Technology | |
| B.S. 1957, Georgetown University | | Odin, Dexter Stetson | D.C. |
| Musumeci, Alfred Vincent | N.Y. | B.S. 1956, University of Florida | |
| B.M.E. 1956, Rensselaer Polytechnic | | O'Donnell, Garland W. | Ga. |
| Institute | | A.B. 1959, The George Washington | |
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| B.S. 1953, University of Nevada | | O'Donnell, Paul E., Jr. | N.Y. |
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| | | Technology | |
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| University | | Olender, Jack H. | |
| Naftalin, Micah H. | Md. | A.B. 1957, LL.B. 1960, University of | Idaho |
| A.B. 1955, Brandeis University | | Pittsburgh | |
| Nahley, Richard L. | Conn. | Oliver, Robert S. | Va. |
| A.B. 1958, Middlebury College | | A.B. 1960, Texas Christian University | |
| Nash, John B. | Va. | Olsen, Dennis M. | Va. |
| A.B. 1935, University of Utah | | B.S. 1957, Brigham Young University | |
| Natalie, Ronald Bruce | Mass. | Olson, Gordon Harold | Va. |
| A.B. 1957, Tufts University | | B.S. 1955, North Dakota Agricultural College | |
| Nateman, Gary M. | Ohio | Olson, Robert Leo | Okla. |
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| Needham, Patricia A. | D.C. | and Technology | |
| A.B. 1959, St. Mary-of-the-Woods College | | O'Neal, Jay J. | Va. |
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| B.E. 1957, Yale University | | O'Neill, James G. | Md. |
| Neimark, Sheridan Lew | Ohio | B.S. in M.E. 1960, Northeastern University | |
| B.S. in Ch.E. 1957, Carnegie Institute of | | Opdyke, Robert Dale | Mass. |
| Technology | | A.B. 1957, Western Michigan College of | |
| Nelson, Julia Ney | Va. | Education | |
| A.B. 1944, University of California | | O'Rourke, Francis James | Ill. |
| Nettles, James A. | S.C. | B.S. 1955, Northeastern University | |
| B.S. 1960, Clemson Agricultural College | | O'Rourke, Thomas W. | Puerto Rico |
| Neuman, Arthur Ewald | Md. | B.S. in Ch.E. 1959, Purdue University | |
| B.S. 1950, Memphis State University | | Ortiz, Silvestre E. | Unab |
| Newland, Danny A. | Fla. | B.C.S. 1958, Louisiana State University | |
| A.B. 1960, College of William and Mary | | and Agricultural and Mechanical College | |
| Newson, Brennan John | Calif. | Osburn, John A. | Md. |
| B.S. 1959, University of San Francisco | | B.S. 1957, Brigham Young University | |
| Ney, Wilbert Roger | Va. | Oswald, Robert L. | Mich. |
| B.S. 1957, Yale University | | A.B. 1960, University of Maryland | |
| Nichol, Gerald Charles | Mich. | O'Toole, Ursula Elizabeth | Iowa |
| A.B. 1957, University of Michigan | | B.S. 1954, Loyola University | |
| Nichols, Charles Robert | N.M. | Otto, Donald Lane | Ind. |
| A.B. 1958, University of New Mexico | | B.S. in M.E. 1959, Iowa State College of | |
| Nimeroff, Bertram | N.Y. | Agriculture and Mechanic Arts | |
| B.E.E. 1942, College of the City of New York | | Overbey, Charles M. | |
| Nixon, William Lynn | Va. | B.S. 1960, Rose Polytechnic Institute | |
| B.S. 1958, Brigham Young University | | P | N.J. |
| Noll, William B. | Va. | | |
| B.Met.E. 1959, Ohio State University | | Pagano, Joseph F. | Ohio |
| Nordberg, Carl A. | Mich. | A.B. 1952, Niagara University | |
| A.B. 1957, University of Michigan | | Paintin, Francis Arthur | Ill. |
| Nordstrom, John Romeo | N.D. | B.S. in Ch.E. 1951, Case Institute of | |
| A.B. 1949, Minnesota State Teachers | | Technology | |
| College, Moorhead | | Pappas, John Tom | Mass. |
| Norrell, Julia Jean | Ark. | B.S. 1959, Northwestern University | |
| A.B. 1957, Ohio Wesleyan University | | Park, Keh Soo | Va. |
| Novosad, Stephen J. | Va. | A.B. 1959, Alfred University | |
| B.S. 1953, Texas Agricultural and | | Parker, Gayle | |
| Mechanical College System | | B.S. 1956, Lafayette College | |
| Noyes, Henry Joseph | Md. | | |
| B.S. 1951, University of Maryland | | | |

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| Parker, Sheldon Harold B.Ch.E. 1957, College of the City of New York | Va. | Pollack, David B.S. in A.E. 1956, University of Miami | Va. |
| Parker, Walter W. III B.S. 1957, University of South Carolina | N.C. | Pollack, Morris Irwin B.S. in M.E. 1954, Newark College of Engineering | Va. |
| Parks, Norman S. A.B. 1955, Transylvania College | Pa. | Polsby, Allen I. A.B. 1959, Brown University | Md. |
| Parlane, Joseph Lucius B.S. in F.S. 1957, Georgetown University | D.C. | Pont, James K. A.B. 1960, Nebraska Wesleyan University | Nebr. |
| Parlee, Woodie Augustus, Jr. A.B. 1943, University of Georgia | D.C. | Porter, Parnell J., Jr. A.B. 1958, University of Pittsburgh | Va. |
| Patterson, James A.B. 1958, University of Michigan | Mich. | Posta, John Joseph B.S. in Eng. 1957, The George Washington University | Va. |
| Pattillo, Helen G. A.B. 1942, University of Utah | Utah | Potter, Holbrook Louis A.B. in Govt. 1951, The George Washington University | Va. |
| Pattillo, James L. A.B. 1950, North Texas State College | Utah | Pournaras, Stephen William A.B. 1942, Brown University | R.I. |
| Patton, Harold R. B.S. in E.E. 1960, Washington University | Va. | M.S. 1951, New York University | |
| Paul, Alan Gilbert B.M.E. 1956, Rensselaer Polytechnic Institute | Va. | Powers, George Richard B.S. 1957, University of Illinois | Ill. |
| Paulick, John Edward B.S. 1952, University of New Hampshire | D.C. | Powers, Thomas P. A.B. 1959, University of Buffalo | D.C. |
| Paul, Paul Arthur B.S. 1958, Northwestern University | Mich. | Pratt, Edwin K. A.B. 1949, Kent State University | Ohio |
| Peck, Joe Lewis A.B. 1948, University of Washington | Oreg. | LL.B. 1950, Western Reserve University | |
| Pelton, Sherwin Carl B.B.A. 1950, LL.B. 1952, University of Wisconsin | Wis. | Preis, Marvin E. B.S. 1958, University of Pennsylvania | Md. |
| LL.M. 1955, New York University | | Pressman, David R. B.S. 1959, Pennsylvania State University | Pa. |
| elizer, Vernon Amos A.B. 1941, DePauw University | Ill. | Preston, Herbert, Jr. A.B. 1947, Cornell University | N.Y. |
| Pertina, Robert S. A.B. 1960, University of Florida | Va. | Preston, Kenneth George, Jr. B.I.E. 1959, Ohio State University | Ohio |
| Peto, Robert R. B.S. in F.S. 1950, Georgetown University | Va. | Price, Ernest E. B.S. 1957, University of Maryland | Md. |
| Pethman, Alan M. A.B. 1960, The George Washington University | D.C. | Price, Robert L. B.S. 1959, Morris Harvey College | Va. |
| Perry, Charles Lyman A.B. 1959, Bethany College | Pa. | Price, Robert Morris A.B. 1959, University of South Carolina | S.C. |
| Perry, Owen Erett B.C.E. 1953, Georgia Institute of Technology | Va. | Prichard, Donald Lee A.B. 1957, The George Washington University | Va. |
| Perry, Thomas C. B.S. 1956, University of Portland | Wash. | Priddy, Robert Ralph B.S. 1958, Principia College | D.C. |
| Peterson, Bennett Pulles B.S. 1959, University of Utah | Va. | Profeta, Samuel J. A.B. 1957, University of Buffalo | N.Y. |
| Peterson, Robert Frederick A.B. 1954, University of Idaho | Idaho | Provost, Nancy Lou A.B. 1956, Pembroke College | Conn. |
| Peterson, Thomas Lee B.S. 1957, Stanford University | Va. | Putnam, Earle Westgate A.B. 1950, Dartmouth College | Va. |
| Pezner, Harold B.S. 1958, Pennsylvania State University | Pa. | Pyles, LeRoy Andrew B.S. 1951, University of Virginia | Md. |
| Phelps, Thomas D. B.S. 1959, Iowa State University of Science and Technology | Ga. | | |
| Phillips, Gabriel B.S. 1956, University of Maryland | Pa. | Quigley, Philip J. M.B., B.Ch., B.A.O. 1954, National University of Ireland, Ireland | Ireland |
| Phillips, Jack Ewart A.B. 1955, University of North Carolina | N.C. | Quill, John Joseph A.B. 1950, Ohio Wesleyan University | Va. |
| Phillips, Ronald L. B.S. 1958, M.S. 1959, University of Kansas | Kans. | Quinn, Thomas Alvord B.S. 1959, Brigham Young University | Conn. |
| Piazza, Maria L. B.S. in E.E. 1960, Northeastern University | Mass. | Quist, Gordon Jay A.B. 1959, Michigan State University of Agriculture and Applied Science | Mich. |
| Force, Ellsworth Thomas A.B. 1956, Northwestern University | D.C. | Quist, Raymond Hugo B.S. 1957, Newark College of Engineering | Va. |
| Finckney, Francis M. B.S. 1957, University of South Carolina | Va. | | |
| Finckney, Robert Steven B.S. in Ch.E. 1959, Iowa State College of Agriculture and Mechanic Arts | Va. | | |
| Fitts, Mildred E. A.B. 1953, Syracuse University | N.Y. | Rabinowitz, Jerry A.B. 1958, West Virginia Wesleyan College | N.Y. |
| Fitts, Michael Terry B.E.E. 1957, Rensselaer Polytechnic Institute | Va. | Rabuse, John R. B.S. 1960, Fordham University | N.J. |
| Flanley, Allan Rudolph A.B. in Govt. 1959, The George Washington University | Del. | Radin, Melvin J. B.B.A. 1960, Tulane University | Va. |
| Fleisher, John Dwight B.I.E. 1957, Ohio State University | Va. | Raizes, Sheldon Foster B.S. in C.E. 1957, University of New Mexico | N.M. |
| Flores, Louis B.B.A. 1959, College of the City of New York | N.Y. | Ramik, Vincent Lawrence B.S. 1957, Pennsylvania State University | Pa. |
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| B.S. in I.E. 1957, Washington University | | A.B. 1958, Duke University | Va. |
| Rawding, George T. | N.J. | Romano, James Joseph, Jr. | N.J. |
| B.B.A. 1958, Upsala College | | M.E. 1956, Stevens Institute of Technology | N.J. |
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| B.S. in E.E. 1952, M.S. 1956, University of Oklahoma | | A.B. 1958, Hood College | D.C. |
| Reagin, Ronald William | Va. | Roselle, Joseph Crescent | Md. |
| B.S. 1958, University of Missouri | | A.B. 1959, Florida Southern College | Conn. |
| Reamer, Leonard M. | Md. | Rosen, Gerald Stuart | Ohio |
| B.S. 1954, University of Maryland | | B.S. 1950, Michigan State University of Agriculture and Applied Science | Ohio |
| Reams, Radford M. III | Va. | Rosenstein, Irwin Bennett | Va. |
| B.E. 1957, Vanderbilt University | | B.S. 1958, University of Pennsylvania | Va. |
| Record, Richard F., Jr. | Ill. | Rossi, Anthony Gerald | Va. |
| B.S. 1959, Georgetown University | | B.S.S. 1957, John Carroll University | Va. |
| Redd, Vi John | Md. | Rothrock, Thomas Jefferson | Va. |
| B.S. 1959, The George Washington University | | B.S. 1955, University of Maryland | Va. |
| Reep, John Ottem | N.D. | Rowland, Bertram Irwin | La. |
| B.S. in I.E. 1957, University of North Dakota | | B.S. 1950, University of California | La. |
| Reeser, Ralph Raymond, Jr. | Md. | Ph.D. 1954, University of Washington | Md. |
| A.B. 1955, University of Washington | | B.S. in Ch.E., A.B. 1956, University of Texas | Md. |
| Reeves, Alvin Clyde | Md. | Rubin, Lonnie Bruce | Pa. |
| A.B. 1952, University of Maryland | | B.S. 1954, University of Maryland | Va. |
| Reich, Lawrence | N.Y. | Rubin, Rose A. | Maine |
| A.B. 1957, University of Arkansas | | Rudge, Howard J. | D.C. |
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| B.S. 1953, Polytechnic Institute of Brooklyn | | Rudman, Paul Lewis | Va. |
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| A.B. 1957, Concordia College | | Ruffner, Ernest L. | Md. |
| Renner, Arnold Edward | Va. | B.S. 1956, U. S. Military Academy | Md. |
| B.S. in E.E. 1954, Purdue University | | Ruppert, Thomas Otto | |
| Renner, Joseph Neil | D.C. | A.B. in Govt. 1957, The George Washington University | |
| B.S. 1955, University of Oregon | | Rusis, Robert Heinrich | |
| Reuben, S. Jesse | Va. | A.B. 1956, The George Washington University | |
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| Revoile, Charles P. | N.J. | Sabatine, Paul Leopold | Md. |
| A.B. 1957, University of Maryland | | B.S. 1950, Georgetown University | N.Y. |
| Reyback, James Mackie | Md. | Sachs, Daniel | Va. |
| B.S. 1943, U. S. Naval Academy | | B.S. 1955, Cornell University | D.C. |
| Reynolds, William Carter | Pa. | Safford, Donald S. | Md. |
| B.S. 1957, Swarthmore College | | A.B. 1955, Colgate University | Va. |
| Rice, Bennie E. | Ark. | Sakayan, Harold Aram | Va. |
| A.B. 1959, University of Arkansas | | B.S. 1957, University of Maryland | Va. |
| Richards, Suzanne Virginia | D.C. | Salem, Irving | |
| A.B. 1948, The George Washington University | | A.B. in Govt. 1957, The George Washington University | |
| Richardson, Gordon Albert | D.C. | Salzberg, Charles | Ohio |
| B.S. 1958, The George Washington University | | A.B. in Govt. 1960, The George Washington University | |
| Richie, David Arthur | Va. | Sammon, Daniel J. | |
| A.B. 1958, Haverford College | | B.S. 1957, Case Institute of Technology | |
| Ridgill, James L., Jr. | N.C. | I.L.B. 1960, Georgetown University | |
| L.L.B. 1960, Southern Methodist University | | Sandell, Charles Wilhelm | |
| Riggins, Wayland Henry | Va. | A.B. 1958, University of Washington | |
| B.S. 1956, Clemson Agricultural College | | Sanders, John F. | |
| Rigler, Douglas V. | Md. | A.B. 1960, University of Tennessee | |
| B.S. 1956, U. S. Naval Academy | | Sandler, Robert Morton | |
| Ringle, John D. | Mich. | A.B. 1958, The George Washington University | |
| A.B. 1955, Michigan State University of Agriculture and Applied Science | | Sanner, Jay Willis | |
| Ritz, Marie Magdalen | Pa. | B.S. 1958, College of William and Mary | |
| A.B. 1957, The George Washington University | | Sather, Arvid Andrew | |
| Roark, Marv Trufant | Va. | A.B. 1954, University of Minnesota | |
| A.B. 1945, Tulane University | | Saxe, John Sheldon | |
| Roberts, Charles Franklin | Wash. | B.S. in Ch.E. 1957, Carnegie Institute of Technology | |
| A.B. 1957, State College of Washington | | Saylor, Walter P. | |
| Roberts, Leslie Adrian | Texas | B.S. 1958, Pennsylvania State University | |
| A.B. 1958, University of Texas | | Scanlon, Richard John, Jr. | |
| Roberts, Sue A. | D.C. | B.S. in M.E. 1952, Michigan College of Mining and Technology | |
| A.B. 1960, The George Washington University | | Scheer, Edward E. | |
| Robinson, Jack Wright | Tenn. | Dr. of Law 1951, Pazmany Peter University, Hungary | |
| B.S. 1955, University of Tennessee | | Scheldrup, John P. | |
| Rockman, Howard B. | Md. | A.B. 1960, Principia College | |
| B.S. in M.E. 1959, Drexel Institute of Technology | | Scherlachner, John P. | |
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| B.S. 1959, North Carolina State College | | Schiller, Samuel I. | |
| Rohr, Joseph | N.Y. | A.B. 1952, Rice Institute | |
| B.M.E. 1957, Rensselaer Polytechnic Institute | | | |

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| Schmalz, Richard L. A.B. 1957, Centre College of Kentucky | Md. | Shagam, Edwin M. B.S. in E.E. 1948, University of Pittsburgh | Md. |
| Schmid, Otto, Jr. B.E.E. 1953, Georgia Institute of Technology | Va. | LL.B. 1959, University of Maryland | Pa. |
| Schmidt, Chadwick A.B. 1951, Washington Missionary College | D.C. | Sharp, Melvin B.S. in E.E. 1957, Drexel Institute of Technology | Pa. |
| Schmidt, Herman Edward A.B. 1956, Washington College | D.C. | Shaw, Clinton Robert A.B. 1959, University of Massachusetts | Va. |
| Schmidt, Wilfred O. B.S. in E.E. 1949, Wayne University | Va. | Sheets, James R. A.B. 1955, State College of Washington | D.C. |
| LL.B. 1955, Georgetown University | | Shepherd, Edward A., Jr. B.S. 1950, University of Maryland | D.C. |
| Schneck, Nathan A.B. 1959, Columbia University | N.Y. | Shepherd, John Tyler B.S. 1942, U. S. Naval Academy | Wash. |
| Schneiberg, Harold Sidney A.B. in Govt. 1957, The George Washington University | D.C. | M.S. 1950, California State Polytechnic College | |
| Schnell, William Nelson A.B. 1958, University of Illinois | Ill. | Sherk, Kenneth John B.S. 1955, State University of Iowa | Iowa |
| Schornhorst, Frederick T. A.B. 1956, Iowa State University of Science and Technology | Iowa | Sherling, Fred Willie B.S. in Ch.E. 1957, University of Tennessee | D.C. |
| Schreiber, Eugene Joseph B.S. in C.E. 1959, Purdue University | Mo. | Sherman, Edward L. A.B. 1951, A.M. 1953, Roosevelt University | Md. |
| Schroen, Dean B.E.E. 1956, Rensselaer Polytechnic Institute | Va. | Sherman, Russell E. A.B. 1958, Duke University | Va. |
| Schucker, Robert M. B.S. 1953, U. S. Naval Academy | N.Y. | Shields, Daniel W. A.B. 1949, Princeton University | Md. |
| Schuetz, William Adolph B.S. in M.E. 1959, Drexel Institute of Technology | Pa. | Shipman, Frederick W. A.B. 1955, The George Washington University | Va. |
| Schultz, James Clement B.S. 1956, University of Nebraska | Nebr. | Shott, Frank B., Jr. B.S. in F.S. 1959, Georgetown University | Mont. |
| Schultz, James Gary A.B. 1958, University of Kansas | Nebr. | Shrinsky, Jason Lee A.B. 1959, University of Pittsburgh | Pa. |
| Schumann, Alfred William B.S. 1949, Lewis and Clark College | Va. | Siegmund, Ralf Hermann Arturo Diploma Geophysiker 1950, University of Berlin, Germany | Va. |
| Schurman, Charles Edwin B.S. 1950, U. S. Merchant Marine Academy | D.C. | Siepmann, Norma K. B.S. 1957, The George Washington University | D.C. |
| Schwartz, Arthur B.S. in I.E. 1958, Iowa State College of Agriculture and Mechanic Arts | Va. | Silber, Richard Joel A.B. 1959, Dickinson College | Pa. |
| Schwartz, Charles H. B.S. in E.E. 1957, Drexel Institute of Technology | Pa. | Silverman, Irving B.S. in Eng. 1959, University of Connecticut | Va. |
| Schwartz, Howard Shelton B.B.A. 1959, University of Miami | Va. | Silverstein, M. Howard B.S. 1959, Northeastern University | D.C. |
| Schwarz, Carl Walter B.C.E. 1958, Cornell University | Wis. | Simmons, William James, Jr. B.S. in E.E. 1957, University of Pittsburgh | Va. |
| Schweitzer, Thomas Charles B.S. in M.E. 1955, Michigan College of Mining and Technology | Mich. | Singer, Donald James B.S. 1956, Michigan State University of Agriculture and Applied Science | Md. |
| Selascia, Richard Salvatore B.S. in E.E. 1949, Lafayette College | Md. | Sinrod, Donald Edward A.B. in Govt. 1959, The George Washington University | D.C. |
| Scott, William Alexander III A.B. 1958, Johns Hopkins University | D.C. | Sippel, Kenneth Fred A.B. 1950, University of California | Va. |
| Smidder, Kenneth R. B.S. in M.E. 1944, Purdue University | Md. | Sitton, Paul Lyon A.B. 1948, Emory University | D.C. |
| B.S. in M.E. 1953, U. S. Naval Postgraduate School | | A.M. 1950, University of Pennsylvania | |
| Seas, Robert John, Jr. B.S. in E.E. 1954, Carnegie Institute of Technology | N.Y. | Sixbey, Daniel Warren A.B. 1954, University of Maryland | Md. |
| Sebastian, Leland Ancel B.S. 1952, Arkansas State Teachers College, Brinkley | Ark. | Skinner, John Vernon, Jr. B.S. 1955, Alabama Polytechnic Institute | Ga. |
| Seemar, Frank Allyn B.S. 1957, University of Connecticut | Md. | Skoler, George Atley A.B. 1952, American International College | N.Y. |
| Segelf, Vern William B.S. in C.E. 1955, Colorado State University | Colo. | Skuba, Michael A.B. 1952, New York University | Conn. |
| Seldeman, Richard Reynolds A.B. 1955, Pennsylvania State University | N.J. | Slover, Julius Elwood B.S. in Ed. 1942, Southeast Missouri State College | Mo. |
| Seller, Donald Waters, Jr. A.B. 1956, College of William and Mary | Va. | LL.B. 1947, University of Texas | Md. |
| Seller, Jerry R. B.S. 1957, University of Arizona | Va. | Smallwood, William E. B.S. 1960, Bradley University | Minn. |
| Selman, Leonard Sandor B.S. 1958, University of Connecticut | N.Y. | Smegal, Thomas Frank, Jr. B.S. in Ch.E. 1957, Michigan College of Mining and Technology | Md. |
| Semonian, Edward, Jr. A.B. 1955, The George Washington University | Va. | Smeltzer, Frederick C. B.S. 1958, University of Maryland | D.C. |
| Seno, Paul Peter B.S. 1954, Carnegie Institute of Technology | Pa. | Smethurst, Raymond Stevens, Jr. B.Met.E. 1958, Cornell University | Fla. |
| | | Smietan, Irwin L. B.S. in M.E. 1955, University of Miami | Pa. |
| | | Smith, Al Lawrence B.S. 1957, Pennsylvania State University | |

| | | | |
|--|-------|--|-----------|
| Smith, Donald LeRoy B.S. 1954, Iowa State College of Agriculture and Mechanic Arts | Iowa | Stiburek, Beverly Joan B.S. 1955, Brigham Young University | Idaho |
| Smith, Jerome David A.B. 1958, University of Alabama | Ala. | Stigaard, John H. B.S. 1960, University of Pennsylvania | Pa. |
| Smith, Richard H. B.S. 1959, Lehigh University | Va. | Stirman, Stanley M. A.B. 1956, Pennsylvania State University | D.C. |
| Smith, Robert Warren B.E.E. 1955, Rensselaer Polytechnic Institute | Md. | Stock, Eugene Allan A.B. 1955, University of Washington | Md. |
| Smith, Warrington G. B.S. 1949, M.B.A. 1950, University of Maryland | Md. | Stockman, Gene W. B.S. 1958, North Dakota Agricultural College | N.D. |
| Smith, William Andrew III B.M.E. 1950, Catholic University of America | Md. | Stoffel, Wolmar John B.S. 1957, University of Wisconsin | D.C. |
| Snead, James Elbert B.S. in E.E. 1959, University of New Mexico | N.M. | Stohltz, John B. B.S. 1960, Brigham Young University | Ariz. |
| Snyder, Dennis Truman A.B. 1957, University of Maryland | Md. | Stoiciu, Virgiliu LL.M. 1953, J.D. 1935, University of Bucharest | D.C. |
| Snyder, Edward Jarrin A.B. 1955, Catholic University of America | D.C. | Stokes, Preston W. B.S. 1957, Clemson Agricultural College | Ga. |
| Snyder, Marvin B.E.E. 1954, Cornell University | N.Y. | Stolarz, Francis J. A.B. 1956, Johns Hopkins University | N.J. |
| Sokolik, Frank F. A.B. 1953, Idaho State College | Idaho | Stone, Robert L. B.S. 1958, Queens College | N.Y. |
| Spaeth, Earl Chester A.B. 1942, Oberlin College | Va. | Stone, Robert Ray A.B. 1958, William Jewell College | N.Y. |
| Spence, Harrison Michael A.B. 1957, University of Idaho | Idaho | Stone, Samuel Beckner B.S. 1955, Virginia Polytechnic Institute | Va. |
| Sperry, Electra A. A.B. 1955, Pennsylvania State University | Pa. | Stone, Steven Faraday B.Ch.E. 1957, Rensselaer Polytechnic Institute | N.Y. |
| Spiher, Alan Thurman, Jr. A.B. 1939, University of California | Va. | Stopak, Bernard B.S. 1949, University of Maryland | D.C. |
| Spradlin, Thomas Richard A.B. 1959, The George Washington University | Okla. | Stretch, Donald J. A.B. 1954, University of Connecticut | Conn. |
| Sprouse, Richard L. B.S. 1957, West Virginia University | Md. | Strobel Raymond Stephen B.S. in M.E. 1956, Washington University | Mo. |
| Stack, Norman L. B.S. 1957, University of Maryland | Md. | Strompf, Jan Arthur B.S. 1958, University of Maryland | Md. |
| Stafford, John Rogers A.B. 1959, Dickinson College | Va. | Studebaker, Blair Ross B.S. 1956, Pennsylvania State University | Va. |
| Stahl, Robert Frederick B.S. 1954, Washington College | D.C. | Sturm, Rex Logan B.S. in I.E. 1959, Iowa State University of Science and Technology | Nebr. |
| Stanham, William Harold B.E. 1953, University of Southern California | Va. | Sturtevant, Peter Albert A.B. 1953, Rollins College | D.C. |
| J.D. 1959, The George Washington University | | Sudjiman, Raden M. Graduate 1948, Faculty of Law, Kyoto University, Indonesia | Indonesia |
| Stanton, James Andrew A.B. 1959, Wabash College | Ind. | Sullivan, John A.B. 1958, Loras College | Ill. |
| Stathopoulos, George Nicholas A.B. 1957, University of Michigan | Mich. | Sullivan, Paul E. B.S. in Ch.E. 1960, Northeastern University | Mass. |
| Staton, Robert Vincent A.B. 1958, University of North Carolina | N.C. | Sullivan, Robert Cook B.S. 1955, Brown University | R.I. |
| Staudt, James Everett B.S. in M.E. 1957, North Dakota Agricultural College | Va. | Sullivan, Robert Emmet A.B. 1949, University of Maine | D.C. |
| Stavros, George P. A.B. 1958, Centre College of Kentucky | Ky. | Sullivan, Vincent Edward B.Ch.E. 1958, Villanova University | Calif. |
| Steaman, John D. A.B. 1957, Butler University | Ind. | Sundheim, Robert Brandt B.S. 1958, Worcester Polytechnic Institute | Mass. |
| Stein, Charles Alan B.S. 1954, Duke University | Md. | Sussman, Peter M. A.B. 1951, Queens College | D.C. |
| Stein, Donald Phillip B.S. 1958, Case Institute of Technology | Ohio | A.M. 1954, University of Virginia | Miss. |
| Stein, Murray Robert B.S. 1953, D. C. Teachers College | Md. | Sutherland, Malcolm Livingston B.S. in Ch.E. 1957, Carnegie Institute of Technology | Va. |
| Steinmetz, Richard Carlton, Jr. B.S. in M.E. 1957, Purdue University | Va. | Sutton, John P. A.B. 1956, University of Virginia | Md. |
| Stephenson, Garth A. A.B. 1951, Brigham Young University | Md. | Swankin, David Arnold A.B. 1954, Brandeis University | Kans. |
| Stern, Howard L. A.B. in Govt. 1959, The George Washington University | Md. | M.S. 1957, University of Wisconsin | N.J. |
| Stern, Marvin Robert B.S. in Ch.E. 1958, Drexel Institute of Technology | Pa. | Swartz, William John B.S. in M.E. 1956, Duke University | Mich. |
| Stern, Sheldon B.S. 1958, New York University | D.C. | Sweeder, Michael Jon B.E. 1957, Yale University | N.M. |
| Sternfels, Lewis B. A.B. 1955, B.S. 1956, Columbia University | D.C. | Sweeney, John Lenney A.B. 1951, A.M. 1954, Michigan State University of Agriculture and Applied Science | |
| Stevens, Gerald F. A.B. 1960, University of Connecticut | Conn. | Swope, William Edwin A.B. 1958, University of New Mexico | |

Sykes, Grant Russell
B.B.A. 1950, Tulane University
A.M. in Govt. 1953, The George Washington University

T

Talbot, John M.
B.S. 1959, University of Maryland Md.
Tamle, Roger Roy
B.S. in I.E. 1957, State University of Iowa Minn.
Taroli, Thomas Louis
B.S. in I.E. 1957, University of Pittsburgh Va.
Taulbee, John E.
A.B. 1958, St. Ambrose College D.C.
Taylor, Daniel A., Jr.
A.B. in Govt. 1960, The George Washington University D.C.
Taylor, Peter S.
A.B. 1960, Washburn University Kans.
Tegtmeyer, Rene D.
B.S. in M.E. 1956, Washington University Mo.
Teodoro, Ramon O.
L.L.B. 1952, San Beda College Philippines
Terry, Ben Abner
B.S. 1958, University of Buffalo W.Va.
Terry, David Thomas
B.S. in Ch.E. 1956, Purdue University Va.
Terzian, Louise A.
B.S. 1934, University of Pennsylvania Md.
Teschner, David
B.S. in E.E. 1955, Newark College of Engineering Va.
Thomas, Carl Otis
B.S. 1957, Texas College of Arts and Industries D.C.
Thomas, Dudley Breckinridge
A.B. 1955, Washington and Lee University D.C.
Thompson, Daniel R.
A.B. 1950, Queen's College Md.
Thompson, John Charles
B.S. 1957, University of Rochester Va.
Thompson, Robert
B.S. 1958, University of Illinois Ill.
Thompson, Robert K.
B.S. 1960, Temple University Del.
Thornton, William Clarence
A.B. 1958, University of Nevada Nev.
Tinsley, William Granville
A.B. 1939, Centre College Va.
Tollford, John Charles
A.B. 1954, University of Michigan Mich.
Toole, James E.
A.B. 1958, King's College Pa.
Toothman, Byron Rimbey
A.B. 1946, Fairmont State College W.Va.
A.M. 1948, West Virginia University
Torchin, Norman Gilbert
B.S. 1951, The George Washington University D.C.
Tower, Robert Gray
B.S. 1941, U. S. Naval Academy Ill.
Townsend, Donald E.
B.S. 1959, University of Missouri Va.
Tranchitella, Nicola
B.S. 1954, Indiana University Md.
Treese, James Rintoul
A.B. 1956, Colgate University Pa.
Tremain, Kenneth Dale
B.S. in C.E. 1956, Purdue University Ohio
Tribble, John Henry
B.S. 1956, The Citadel S.C.
Trimas, Marvin
B.S. 1956, Pennsylvania State University Va.
Trowol, Natalie
A.B. 1947, A.M. 1950, Columbia University D.C.
Truluck, Dalton Loftis
B.S. 1956, Clemson Agricultural College S.C.
Trust, Frederick E.
A.B. 1958, Pennsylvania State University D.C.
Tucker, Michael
A.B. 1960, University of Delaware Del.

Tucker, Robert Paul
A.B. in Govt. 1960, The George Washington University Md.
Tung, Ta-Hsung N.
B.S. 1960, University of Maryland D.C.
Tupman, Wilbur Crandell
B.I.E. 1949, Georgia Institute of Technology Va.
Turnbull, Henry R. III
A.B. 1959, Johns Hopkins University Md.
Turnage, Kirby L., Jr.
A.B. 1957, University of Alabama Miss.
Turpen, Donald Cleveland
B.S. 1959, University of New Mexico N.M.
Turshen, Ethan Allen
A.B. 1954, Kenyon College N.Y.
M.P.A. 1955, Syracuse University
Tvedt, Vernon L.
B.S. 1958, University of North Dakota D.C.
Twohey, Thomas Michael
B.S. 1959, University of Maryland Md.

U

Udui, Kaleb
A.B. 1960, The George Washington University Philippines
Uilkema, John Klaas
B.S.E. 1957, University of Michigan Va.
Urbach, Peter Frank
B.S. in E.E. 1957, Carnegie Institute of Technology Va.
Usrey, Marvin W.
B.S. in M.E. 1959, New Mexico State University N.M.

V

Valentine, Andrew Jackson
B.S. 1945, U. S. Naval Academy Fla.
Vance, Anthony Charles
B.S. 1954, Pennsylvania State University Pa.
Vanderburg, John Perley
B.S.E. 1956, University of Michigan Mich.
Vande Sande, George
B.S.E. 1948, University of Michigan Md.
Van Kirk, Roger Alan
B.S. in E.E. 1957, University of Vermont N.J.
Van Metre, John Lee, Jr.
A.B. 1959, Duke University W.Va.
Vartzikos, Nicholas
A.B. in Govt. 1959, The George Washington University Wis.
Vatske, Albert Ivan
A.B. 1959, University of Connecticut N.H.
Vaughan, Roger A., Jr.
B.S. 1956, U. S. Merchant Marine Academy Md.
Velde, Richard Whittington
B.S. 1953, A.M. 1954, Bradley University Ill.
Vetter, John Ernest
A.B. 1953, University of Rochester Va.
Viccellio, Nancy Blair
A.B. 1934, Meredith College Va.
A.M. 1939, University of Virginia
Vickers, Robert Vernon
B.M.E. 1957, General Motors Institute Va.
Visck, Franklin Joseph
B.S. 1957, Municipal University of Omaha Nebr.
Visick, Hubert H.
A.B. 1955, Brigham Young University Md.
Vogel, Joseph Peter
B.S. 1958, South Dakota State College of Agriculture and Mechanic Arts Minn.
Volterra, Max
B.S. 1957, Brown University D.C.

W

Wakefield, Blair P.
B.S. 1941, University of Pittsburgh Pa.
Walch, Victor L.
B.S. 1960, University of Utah Va.
Wall, Tamara Jaffe
A.B. 1955, Lewis and Clark College Oreg.

| | | | |
|--|--------|---|-------|
| Waller, John Robert | Md. | Whitescarver, James F., Jr. | D.C. |
| B.S. 1953, Georgetown University | | A.B. 1953, Duke University | Va. |
| Wallis, Charles E. | N.Y. | Whitlock, Douglas H. | Texas |
| B.S. 1959, Northwestern University | | A.B. 1955, Duke University | S.C. |
| Walls, Donald Francis | D.C. | Whitman, Bruce Nairn | D.C. |
| A.B. 1954, M.B.A. 1959, Cornell University | | A.B. 1955, Trinity College | |
| Ward, Julia | D.C. | Wicker, Raymond Kiefer | D.C. |
| A.B. 1923, Ph.D. 1940, Bryn Mawr College | | B.S. 1951, Newberry College | |
| Wardell, Richard Norman | D.C. | LL.B. 1959, University of South Carolina | |
| B.S. 1952, Illinois Institute of Technology | Kans. | Wiener, Richard | Va. |
| Warden, Ernest Albert | | A.B. 1950, Columbia University | |
| A.B. 1955, University of Wichita | Va. | Wilbur, Helen Jeanette | R.I. |
| Warlick, George William | | A.B. 1956, Bates College | |
| B.S. in E.E. 1956, Duke University | Ill. | Wilcox, Ruth E. | Va. |
| Wasniewski, James L. | | A.B. 1959, West Virginia Wesleyan College | |
| A.B. 1960, Marquette University | Va. | Wildhack, William A., Jr. | D.C. |
| Waterval, Richard Adolf | | B.S. 1957, Miami University | D.C. |
| A.B. 1952, University of Maryland | W. Va. | Willcox, James R. | |
| Watkins, William H. | | B.S. 1959, University of Oregon | |
| A.B. 1958, LL.B. 1960, West Virginia University | Mich. | Willette, Helen Barbara | Md. |
| Watkinson, William Willison | | A.B. 1941, Syracuse University | |
| A.B. 1959, Western Michigan College | W. Va. | Williams, David O. | Ark. |
| Watson, William Edward | | A.B. 1960, Dickinson University | |
| A.B. 1958, West Virginia Wesleyan College | Tenn. | Williams, Gerald Edward | Tenn. |
| Weakley, Harold Wade | | B.S. 1955, Delta State College | |
| B.S. 1954, Tennessee Polytechnic Institute | Pa. | Williams, James William | Okla. |
| Weaver, James Richard | | B.S. in E.E. 1957, Vanderbilt University | |
| B.S. 1957, Elizabethtown College | D.C. | Williams, Jerry Don | Va. |
| Webb, Harold | | B.B.A. 1959, University of Oklahoma | |
| B.S. 1953, University of Alabama | Tenn. | Williams, Melvin Pearson | Md. |
| Webb, Haven Noel | | B.E.E. 1957, Rensselaer Polytechnic Institute | |
| B.S. 1954, U. S. Naval Academy | Md. | Williams, Spencer Benjamin, Jr. | Va. |
| Webb, Thomas Harry | | A.B. 1947, College of William and Mary | |
| B.S. in C.E. 1944, Ohio Northern University | Ohio | Williamson, Harold Anthony | D.C. |
| Weber, William L., Jr. | | B.S. 1957, University of Wisconsin | |
| B.S. 1956, Marquette University | D.C. | Williamson, Walter L. | N.Y. |
| Weeks, Cora Emma | | B.S. 1960, Brigham Young University | |
| A.B. 1957, Miami University | D.C. | Willinger, Warren Jay | N.C. |
| Weilacher, Robert George | | A.B. in Govt. 1959, The George Washington University | |
| B.S. 1957, Columbia University | D.C. | Willis, William A., Jr. | Md. |
| Weinmann, Eric W. | | B.S. 1958, University of North Carolina | |
| Diploma 1935, Handelshochschule, Germany | Md. | Willoner, Ronald Andrew | N.C. |
| A.M. 1943, Columbia University | Maine | A.B. 1955, University of Maryland | |
| Weinstein, Les J. | | Willson, Leonard Alfred, Jr. | Va. |
| B.S. in M.E. 1956, University of Pennsylvania | | B.M.E. 1957, North Carolina State College | |
| Welch, John Edward | | Wilson, Edwin Paul | D.C. |
| B.S. 1953, University of Maine | Va. | A.B. 1951, University of Portland | |
| Welch, Paul Hesse | | Winebrenner, Tommy L. | Tenn. |
| A.B. in Govt. 1957, The George Washington University | D.C. | B.S. 1960, American University | |
| Wells, Alfred, Jr. | | Winer, David E. | N.Y. |
| B.S. 1955, University of South Carolina | Ky. | B.E. 1956, Vanderbilt University | |
| Welther, Frederick L. | | Wing, John Adams | D.C. |
| A.B. 1960, Duke University | | A.B. 1958, Union College | |
| Wendt, William Robert | | Wintercorn, Richard A. | Idaho |
| B.S. 1935, University of Wisconsin | Md. | A.B. 1957, Rockford College | |
| Wenger, Don S. | | Wise, Joseph G. | Va. |
| A.B. 1934, University of Wisconsin | | B.S. 1960, Brigham Young University | |
| M.D. 1937, Marquette University | | Wise, Robert Wayne | D.C. |
| M.S. 1957, Georgetown University | | B.S. 1956, McPherson College | |
| West, Ronald D. | | Wisecarver, Betty Marie | Ill. |
| A.B. in Govt. 1958, The George Washington University | Texas | A.B. 1957, Mary Washington College | |
| Westerman, Christian G. | | Witherspoon, John F. | D.C. |
| B.S. 1955, University of Virginia | Va. | B.S. 1955, M.E. 1958, M.S. 1960, University of Illinois | |
| Weyer, Albert Sheldon | | Witt, William Henry | N.Y. |
| B.S. in Ch.E. 1956, University of Wisconsin | D.C. | A.B. 1941, Harvard University | |
| Wheelless, Kenneth Gordon | | Wohl, Paul | D.C. |
| B.S. 1959, University of Arkansas | Ark. | A.B. in Govt. 1954, The George Washington University | |
| Whillock, Carl Simpson | | Wolfe, Alan David | Va. |
| B.S. in S.W. 1948, A.M. 1951, University of Arkansas | D.C. | B.S. 1952, Queens College | |
| Whisenhunt, Fred Smith, Jr. | | Wolfe, William S. | N.Y. |
| B.Ch.E. 1956, North Carolina State College | Iowa | B.S. in E.E. 1959, Lehigh University | |
| Whisler, John William | | Wolff, Nancy I. | N.Y. |
| B.S. 1957, Iowa State College of Agriculture and Mechanic Arts | Md. | A.B. 1954, Wellesley College | Ala. |
| White, Leonard A. | | B.S. in A.E. 1959, University of Alabama | |
| B.M.E. 1959, The George Washington University | Va. | Wood, Bobby C. | D.C. |
| White, Wayne D. | | B.S. 1959, University of Alabama | |
| A.B. 1953, Brigham Young University | | Woodruff, Eugene Bruce | |
| | | B.S. 1954, University of Michigan | |
| | | M.D. 1957, Purdue University | |

Woodward, Charles Carroll Maccubbin
B.S. 1951, Virginia Military Institute
Worthington, Raymond Leroy
B.S. 1941, University of Maryland
Wray, James Creighton
B.M.E. 1958, Villanova University
Wright, Joseph S., Jr.
A.B. 1960, Beloit College
Wyman, Charles M.
A.B. 1953, The George Washington
University

Y

Yeager, Frederick G.
B.S. 1960, University of South Dakota
Yeatman, William Paul
B.S. 1954, D. C. Teachers College
Young, Glenn F.
B.S. 1955, U. S. Coast Guard Academy
Young, Harvey A.
B.S. in E.E. 1960, Drexel Institute of
Technology
Young, Roger Donald
A.B. 1957, Randolph-Macon College
Young, Truman Richards
LL.B. 1932, The George Washington
University
Yurov, Victor R.
B.M.E. 1956, The George Washington
University

Md.

Z

Zaratian, Virginia Louise
B.S. 1942, B.S. in Phar. 1946, M.S. 1949,
University of Michigan
Ph.D. 1956, Wayne University
Zarnosky, Peter
B.S. 1954, University of Scranton
Zeiger, Leon
Zekas, Raymond
A.B. 1958, Temple University
Zettler, Arthur Michael
A.B. 1959, University of Maryland
Ziebarth, Thomas A.
LL.B. 1955, LL.M. 1957, Georgetown
University
Zieg, Robert Lloyd
B.I.E. 1956, General Motors Institute
Zichm, Eugene Carl
A.B. 1959, University of Buffalo
Zinn, Robert J.
B.M.S. 1956, M.S. 1959, Bucknell University
Zoole, Jon L.
A.B. 1960, Duke University
Zugel, Francis Kopp
B.S. in Eng. 1957, The George Washington
University

Mich.

Pa.

D.C.

D.C.

Md.

D.C.

Va.

Md.

Pa.

Md.

Md.

Calif.

D.C.

SUMMARIES OF REGISTRATION

SPRING SEMESTER 1959-60, SUMMER TERM 1960,

FALL SEMESTER 1960-61

GEOGRAPHICAL DISTRIBUTION OF STUDENTS

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|----------------------|-----|----------------|-----|
| Alabama | 5 | New Mexico | 8 |
| Arizona | 4 | New York | 71 |
| Arkansas | 6 | North Carolina | 15 |
| California | 12 | North Dakota | 4 |
| Colorado | 5 | Ohio | 28 |
| Connecticut | 14 | Oklahoma | 10 |
| Delaware | 13 | Oregon | 6 |
| District of Columbia | 251 | Pennsylvania | 72 |
| Florida | 11 | Rhode Island | 4 |
| Georgia | 4 | South Carolina | 9 |
| Hawaii | 5 | South Dakota | 1 |
| Idaho | 15 | Tennessee | 8 |
| Illinois | 30 | Texas | 12 |
| Indiana | 14 | Utah | 13 |
| Iowa | 23 | Vermont | 1 |
| Kansas | 8 | Virginia | 361 |
| Kentucky | 2 | Washington | 10 |
| Louisiana | 6 | West Virginia | 12 |
| Maine | 8 | Wisconsin | 13 |
| Maryland | 213 | Wyoming | 2 |
| Massachusetts | 18 | Canada | 2 |
| Michigan | 24 | Ethiopia | 1 |
| Minnesota | 6 | India | 1 |
| Mississippi | 2 | Indonesia | 1 |
| Missouri | 9 | Ireland | 1 |
| Montana | 1 | Italy | 2 |
| Nebraska | 8 | Korea | 3 |
| Nevada | 4 | Philippines | 1 |
| New Hampshire | 5 | Scotland | |
| New Jersey | 28 | | |

GRADUATES OF COLLEGES REGISTERED IN THE LAW SCHOOL

| | | | |
|---|----|------------------------------------|----|
| Abilene Christian College | 2 | Bard College | 1 |
| Akron, University of | 2 | Bates College | 2 |
| Alabama, Polytechnic Institute | 4 | Beloit College | 2 |
| Alabama, University of | 10 | Berlin, University of, Germany | 1 |
| Albright College | 1 | Bethany College | 1 |
| Alfred University | 2 | Bordeaux, University of, France | 3 |
| Allegheny College | 1 | Boston College | 3 |
| American International College | 2 | Boston University | 2 |
| American University | 12 | Bowdoin College | 1 |
| Amherst College | 1 | Bowling Green State University | 4 |
| Antioch College | 1 | Bradley University | 2 |
| Arizona, University of | 7 | Brandeis University | 24 |
| Arkansas State Teachers College | 1 | Brigham Young University | 6 |
| Arkansas, University of | 5 | Brooklyn College | 5 |
| Augustana College | 1 | Brooklyn, Polytechnic Institute of | 9 |
| Bangalore Government Law School, India | 1 | Brown University | 1 |
| | | Bryn Mawr College | |

| | | | |
|---|-----|---|----|
| Bucharest, University of, Hungary ... | 1 | Handelschickschule | 1 |
| Bucknell University | 3 | Harvard University | 14 |
| Buffalo, University of | 5 | Haverford College | 2 |
| Butler University | 2 | Hawaii, University of | 1 |
| California State Polytechnic College.. | 2 | High Point College | 1 |
| California, University of | 10 | Hobart College | 1 |
| California, University of, at Los Angeles | 3 | Hofstra College | 1 |
| Carnegie Institute of Technology | 13 | Hood College | 1 |
| Case Institute of Technology | 4 | Howard University | 2 |
| Catawba College | 1 | Hunter College | 2 |
| Catholic University of America | 4 | Idaho State College | 2 |
| Central Missouri State College | 1 | Idaho, University of | 9 |
| Central State College | 1 | Illinois Institute of Technology | 1 |
| Centre College of Kentucky | 3 | Illinois, University of | 14 |
| Charleston, College of | 1 | Indiana University | 9 |
| Chicago, University of | 3 | Inter-American University of Puerto Rico | 1 |
| Cincinnati, University of | 5 | Iowa State College of Agriculture and Mechanic Arts | 5 |
| Citadel, The | 2 | Iowa State Teachers College | 9 |
| Clark University | 1 | Iowa, State University of | 15 |
| Clarkson College of Technology | 1 | Jamestown College | 1 |
| Clemson Agricultural College | 8 | John Carroll University | 2 |
| Colby College | 1 | Johns Hopkins University | 8 |
| Colgate University | 5 | Kansas State Teachers College | 2 |
| Colorado School of Mines | 3 | Kansas, University of | 9 |
| Colorado State College of Education.. | 1 | Kent State University | 2 |
| Colorado State University | 1 | Kentucky, University of | 2 |
| Colorado, University of | 6 | King's College | 2 |
| Columbia College | 1 | Kenyon College | 3 |
| Columbia University | 21 | Kyoto University | 1 |
| Concordia College | 1 | Lafayette College | 9 |
| Connecticut, University of | 11 | Laras College | 1 |
| Cornell University | 22 | LaSalle College | 1 |
| Dartmouth College | 4 | Lehigh University | 6 |
| Delaware, University of | 5 | Lemoyne College | 1 |
| Delta State College | 1 | Lewis and Clark College | 4 |
| Denison University | 1 | Long Island University | 1 |
| Denver, University of | 1 | Louisiana State University | 5 |
| DePauw University | 2 | Lowell Institute of Technology | 1 |
| Detroit, University of | 2 | Loyola University | 3 |
| Dickinson College | 7 | Lwow, University of, Poland | 1 |
| District of Columbia Teachers College | 3 | Maharaja's College, India | 1 |
| Drexel Institute of Technology | 16 | Maine, University of | 4 |
| Duke University | 19 | Manuel L. Quezon University | 1 |
| East Tennessee State College | 1 | Mankato State College | 1 |
| Elizabethtown College | 1 | Marquette University | 5 |
| Emory University | 1 | Marshall College | 2 |
| Evansville College | 1 | Maryknoll College | 1 |
| Fairmont State College | 2 | Maryland State Teachers College, Frostburg | 1 |
| Florida Southern College | 1 | Maryland, University of | 77 |
| Florida State University | 1 | Maryville College | 3 |
| Florida, University of | 9 | Mary Washington College | 1 |
| Fordham University | 6 | Massachusetts Institute of Technology.. | 6 |
| Franklin and Marshall College | 1 | Massachusetts, University of | 4 |
| General Motors Institute | 3 | McKendree College | 1 |
| George Washington University, The | 118 | McMaster University, Canada | 1 |
| Georgetown University | 35 | McPherson College | 1 |
| Georgia Institute of Technology | 7 | Memphis State College | 1 |
| Georgia State College for Women | 1 | Meredith College | 1 |
| Georgia, University of | 3 | Miami University | 5 |
| Gettysburg College | 1 | Miami, University of | 10 |
| Glasgow University, Scotland | 1 | | |
| Grove City College | 1 | | |
| Hamline University | 1 | | |

| | | | |
|---|----|--|----|
| Michigan College of Mining and Technology | 10 | Portland, University of | 2 |
| Michigan State University of Agriculture and Applied Science .. | 6 | Presbyterian College | 1 |
| Michigan, University of | 27 | Princeton University | 8 |
| Middlebury College | 2 | Principia College | 2 |
| Milan, University of | 1 | Providence College | 1 |
| Minnesota State Teachers College, Moorhead | 1 | Purdue University | 24 |
| Minnesota, University of | 6 | Queens College | 5 |
| Mississippi Southern College | 1 | Radeliffe College | 1 |
| Missouri School of Mines | 1 | Randolph-Macon College | 2 |
| Missouri, University of | 11 | Rensselaer Polytechnic Institute | 26 |
| Montana State College | 2 | Rhode Island, University of | 1 |
| Montana State University | 3 | Rice Institute | 1 |
| Montclair State College | 1 | Richmond, University of | 1 |
| Morris Harvey College | 1 | Richmond Professional Institute | 5 |
| Mount St. Mary College | 1 | Rochester, University of | 1 |
| Muhlenberg College | 2 | Rockford College | 1 |
| National University | 1 | Rollins College | 1 |
| Nebraska State Teachers College, Kearney | 1 | Roanoke College | 2 |
| Nebraska, University of | 3 | Roosevelt University | 7 |
| Nebraska Wesleyan University | 1 | Rose Polytechnic Institute | 4 |
| Nevada, University of | 4 | Rutgers University | 1 |
| New England College of Pharmacy .. | 1 | St. Ambrose College | 2 |
| New Hampshire, University of | 9 | St. John's College | 3 |
| New Mexico College of Agriculture and Mechanic Arts | 1 | St. Louis University | 1 |
| New Mexico, University of | 10 | St. Mary-of-the-Woods College | 1 |
| New York, College of the City of .. | 10 | St. Olaf College | 1 |
| New York State Maritime College .. | 1 | St. Peter's College | 1 |
| New York University | 9 | St. Vincent College | 1 |
| Newark College of Engineering | 6 | San Beda College | 1 |
| Newberry College | 1 | San Bernardo University, Ethiopia .. | 1 |
| Niagara University | 2 | San Diego State College | 1 |
| North Carolina State College | 5 | San Francisco, University of | 2 |
| North Carolina, University of | 14 | Scranton, University of | 1 |
| North Dakota Agricultural College .. | 4 | Scuola Di Curisprudenza, Ethiopia .. | 1 |
| North Dakota, University of | 2 | Seoul National University, Korea .. | 1 |
| North Texas State College | 2 | Seton Hall University | 1 |
| Northeastern University | 7 | Simmons College | 1 |
| Northwestern University | 13 | Smith College | 6 |
| Northwestern Technological Institute .. | 1 | South Carolina, University of | |
| Notre Dame, University of | 5 | South Dakota School of Mines and Technology | 4 |
| Oberlin College | 2 | South Dakota State College of Agriculture and Mechanic Arts .. | 2 |
| Ohio Northern University | 2 | South Dakota, University of | 3 |
| Ohio State University | 16 | South, University of the | 1 |
| Ohio University | 5 | Southeast Missouri State College | 1 |
| Ohio Wesleyan University | 3 | Southern California, University of .. | 3 |
| Oklahoma State University | 3 | Southern Illinois University | 2 |
| Oklahoma, University of | 14 | Southern Methodist University | 1 |
| Omaha, Municipal University of | 1 | Southern Missionary College | 2 |
| Oregon State College | 3 | Southwestern College | 5 |
| Oregon, University of | 5 | Southwestern University | 1 |
| Pazmany Peter University | 1 | Stanford University | 2 |
| Pennsylvania State Teachers College, Bloomsburg | 1 | Stevens Institute of Technology | 1 |
| Pennsylvania State Teachers College, Indiana | 1 | Swarthmore College | 7 |
| Pennsylvania State University | 39 | Sweet Briar College | 1 |
| Pennsylvania, University of | 12 | Syracuse University | 6 |
| Pittsburgh, University of | 15 | Taylor University | 2 |
| | | Temple University | 7 |
| | | Tennessee Polytechnic Institute | |
| | | Tennessee, University of | 1 |
| | | Texas Agricultural and Mechanical College | |

| | | | |
|---|----|--|----|
| Texas Christian University | 1 | Washington College | 2 |
| Texas College of Arts and Industries .. | 3 | Washington and Lee University | 5 |
| Texas Technological College | 1 | Washington Missionary College | 3 |
| Texas, University of | 9 | Washington, State College of | 3 |
| Thiel College | 1 | Washington University | 10 |
| Toledo, University of | 1 | Washington, University of | 10 |
| Transylvania College | 1 | Wayne State University | 2 |
| Trinity College | 2 | Wayne University | 2 |
| Tufts University | 5 | Wellesley College | 1 |
| Tulane University | 5 | Wesleyan University | 2 |
| Tulsa, University of | 1 | West Virginia Institute of Technology .. | 1 |
| Union College and University | 1 | West Virginia University | 12 |
| U. S. Coast Guard Academy | 6 | West Virginia Wesleyan College | 3 |
| U. S. Merchant Marine Academy ... | 3 | Western Maryland College | 1 |
| U. S. Military Academy | 3 | Western Michigan College of | |
| U. S. Naval Academy | 16 | Education | 2 |
| U. S. Naval Post Graduate School ... | 1 | Western Reserve University | 1 |
| Upsala College | 2 | Wichita, University of | 3 |
| Utah State University of Agriculture | | Wilkes College | 2 |
| and Applied Science | 5 | William and Mary, College of | 13 |
| Utah, University of | 15 | William Jewell College | 1 |
| Vanderbilt University | 5 | Williams College | 2 |
| Vassar College | 1 | Wisconsin State College | 2 |
| Vermont, University of | 5 | Wisconsin, University of | 15 |
| Villanova University | 4 | Wofford College | 1 |
| Virginia Military Institute | 7 | Wooster, College of | 1 |
| Virginia Polytechnic Institute | 13 | Worcester Polytechnic Institute | 2 |
| Virginia, University of | 13 | Wyoming, University of | 3 |
| Wabash College | 3 | Yale University | 10 |
| Wake Forest College | 1 | Yankton College | 1 |
| Washburn University of Topeka | 1 | Yeshiva University | 1 |

SUMMARY OF LAW SCHOOL REGISTRATION

FALL SEMESTER 1960-61

| | Men | Women | Total |
|--|-------|-------|-------|
| First Year | 341 | 17 | 358 |
| Second Year | 297 | 12 | 309 |
| Third Year | 362 | 17 | 379 |
| Candidates for degree of Master of Laws .. | 17 | 1 | 18 |
| Candidates for degree of Master of Comparative Law | 2 | .. | 2 |
| Candidates for degree of Master of Comparative Law | | | |
| (American Practice) | .. | 1 | 1 |
| Candidates for degree of Doctor of Juridical Science | 7 | .. | 7 |
| Unclassified | 20 | 1 | 21 |
| TOTAL | 1,046 | 49 | 1,095 |

S

Scholarship, 16, 17, 23, 26, 29
Scholarships, 20
Student:
 Bar Association, 15
 Employment, 25
 Life, 24-25
Students registered, 45-65
Summaries of Registration, 66-69
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Teaching Fellows, 12
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University:
 Academic status, 5
 Colleges, Schools, Divisions, 5
 History, 5
 Location, 5

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Van Vleck Case Club, 15

W

Withdrawal and refunds, 19-20

THE GEORGE WASHINGTON UNIVERSITY

Washington 6, D. C.

Academic programs leading to degrees are offered in the following colleges and schools:

- Junior College: Associate in Arts (A.A.) and Associate in Science (A.S.)
Columbian College: Bachelor of Arts (A.B.), Bachelor of Science (B.S.), Bachelor of Science in Medical Technology (B.S. in Med. Tech.), Master of Arts (A.M.), Master of Fine Arts (M.F.A.), and Master of Science (M.S.)
Graduate Council: Doctor of Philosophy (Ph.D.)
School of Medicine: Doctor of Medicine (M.D.)
Law School: Bachelor of Laws (LL.B.), Master of Laws (LL.M.), Master of Comparative Law (M. Comp. L.), Master of Comparative Law (American Practice) (M. Comp. L. (Am. Prac.)), and Doctor of Juridical Science (S.J.D.)
School of Engineering: Bachelor of Civil Engineering (B.C.E.), Bachelor of Electrical Engineering (B.E.E.), Bachelor of Mechanical Engineering (B.M.E.), Bachelor of Science in Engineering (B.S. in Eng.), Master of Science in Engineering (M.S. in Eng.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)
School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.) and Master of Science in Pharmacy (M.S. in Phar.)
School of Education: Bachelor of Arts in Education (A.B. in Ed.), Bachelor of Science in Home Economics (B.S. in H.E.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (Adv. Prof. Cert.), and Doctor of Education (Ed.D.)
School of Government, Business, and International Affairs: Bachelor of Arts in Government (A.B. in Govt.), Bachelor of Business Administration (B.B.A.), Master of Arts in Government (A.M. in Govt.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)
College of General Studies: Associate in Arts (A.A.(C.G.S.)), Associate in Science (A.S.(C.G.S.)), Associate in Secretarial Administration (A.Sec.Adm.), Bachelor of Arts (A.B.(C.G.S.)), Bachelor of Science in Cartography (B.S. in Cart.), Master of Arts (A.M.(C.G.S.)), Master of Arts in International Affairs (A.M. in I.A.), and Master of Business Administration (M.B.A.(C.G.S.)).

ANNUAL ISSUES OF THE UNIVERSITY BULLETIN

Requests for the following publications should be addressed as indicated.

| | |
|--|--|
| College of General Studies..... | Dean of the College of General Studies |
| General Catalogue of the University..... | Director of Admissions |
| Graduate Council..... | Dean of the Graduate Council |
| Law School..... | Director of Admissions |
| School of Education..... | Director of Admissions |
| School of Engineering..... | Dean of the School of Engineering |
| School of Medicine..... | Director of Admissions |
| Summer Sessions..... | Dean of the Summer Sessions |
| Fellowships, Scholarships, Prizes, Financial Aid..... | Chairman, Committee on Scholarships |

THE GEORGE WASHINGTON UNIVERSITY

1821

The Junior College

1930

Columbian College (the Senior College)

1821

The Graduate Council

1893

The School of Medicine

1825

The Law School

1865

The School of Engineering

1884

The School of Pharmacy

1906

The School of Education

1907

The School of Government, Business, and International Affairs

1928

The College of General Studies

1950

The Division of University Students

1930

The Division of Special Students

1944

The Division of Air Science

1951

The Summer Sessions

1916

The University Hospital

1898

THE
GEORGE
WASHINGTON
UNIVERSITY

BULLETIN

THE SCHOOL OF ENGINEERING
1961-62



WASHINGTON 6, D. C.
NOVEMBER 1960

VOL. LX

No. 3

CORRESPONDENCE DIRECTORY

Detailed information may be obtained by addressing inquiries as indicated below. For any information not included here, please write to the Director of Admissions, The George Washington University, Washington 6, D. C.

Information concerning courses of instruction and the programs of the several colleges and schools will be found in separate issues of the University Bulletin, which are listed on the inside back cover.

| | |
|-------------------------|---|
| Admission..... | Director of Admissions, Building C |
| Air Science (ROTC)..... | Director of Air Sciences, Chapin Hall |
| Alumni Association..... | Office of Alumni Relations, Bacon Hall |
| Foreign Students..... | Adviser to Foreign Students, Building T |
| Graduate Study | |

In Arts and Sciences

| | |
|---------------------------|------------------------------|
| Master's degrees..... | Dean of Columbian College |
| Doctor of Philosophy..... | Dean of The Graduate Council |

| | |
|-------------------|---------------------------------|
| In Education..... | Dean of The School of Education |
|-------------------|---------------------------------|

| | |
|---------------------|--|
| In Engineering..... | Committee on Graduate Studies, School of Engineering |
|---------------------|--|

| | |
|-------------|---|
| In Law..... | Chairman of the Committee on Graduate Studies, The Law School |
|-------------|---|

| | |
|--|--------------------|
| In the School of Government, Business, and International Affairs..... | Dean of the School |
|--|--------------------|

In Accounting, Business Administration, Business and Economic Statistics, Economic Policy, Hospital Administration, International Affairs, Personnel Administration, Public Administration, Public Affairs

Housing

| | |
|------------|--|
| Men..... | Director of Men's Activities, Building Q |
| Women..... | Director of Women's Activities, Woodhull House |

| | |
|-------------------|---|
| Scholarships..... | Chairman, Committee on Scholarships, Building T |
|-------------------|---|

| | |
|-------------------------|---|
| Student Employment..... | Student Placement Office, 2114 G Street NW. |
|-------------------------|---|

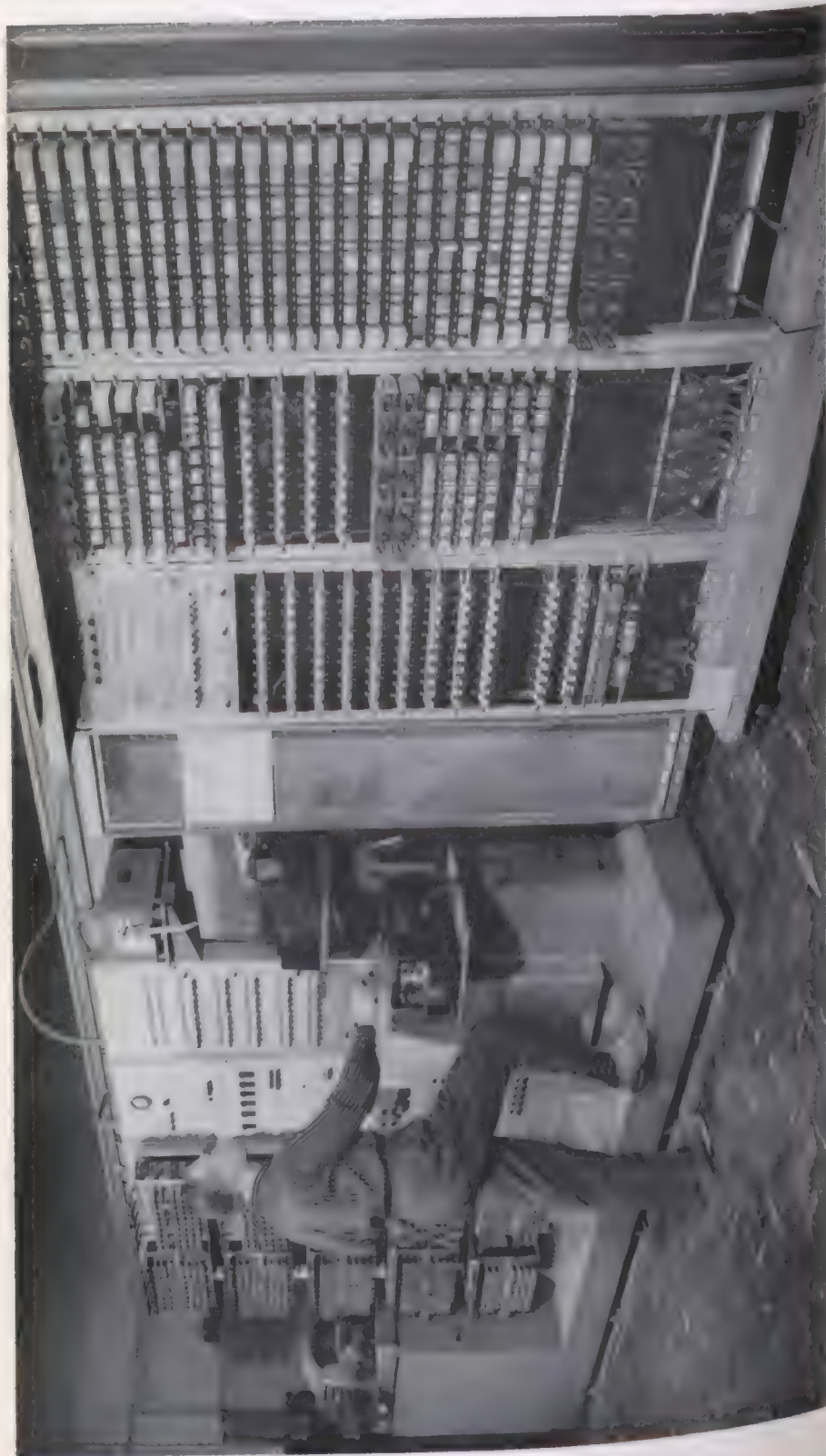
| | |
|----------------------|---|
| Summer Sessions..... | Dean of the Summer Sessions, Building T |
|----------------------|---|

| | |
|-----------------------------|-----------------------|
| Transcripts of Records..... | Registrar, Building C |
|-----------------------------|-----------------------|

| | |
|-------------------------|--|
| Veterans Education..... | Director of Veterans Education, Building Q |
|-------------------------|--|



TOMPKINS HALL OF ENGINEERING



ONE OF THE ELECTRICAL ENGINEERING LABORATORIES

THE SCHOOL OF ENGINEERING
1961 - 62

THE
GEORGE
WASHINGTON
UNIVERSITY
BULLETIN

VOL. LX

No. 3

THE SCHOOL OF ENGINEERING

WASHINGTON, D. C.

PUBLISHED IN NOVEMBER
MCMLX

BY THE UNIVERSITY

PUBLISHED BY THE UNIVERSITY
AT WASHINGTON, D. C.
APRIL, JUNE, JULY, AUGUST, OCTOBER, NOVEMBER (2 ISSUES), AND DECEMBER (2 ISSUES)
SECOND-CLASS POSTAGE PAID AT WASHINGTON, D. C.

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CALENDAR

1961-62

FALL SEMESTER:

1961

Advising for freshmen, sophomores, and all new students
Orientation Assembly: all new students.....
Placement tests for entering freshmen.....
Curriculum assemblies: new students attend one
Qualifying examinations
Graduate registration *
Undergraduate registration †
Classes begin
Subjects of Master's theses of Feb. candidates due in Dean's Office.....
Fall Convocation
Applications for Feb. graduation due in Registrar's Office
Veterans Day. Holiday
Thanksgiving recess
Graduate Record Examination
Christmas recess

Sept. 11-20 Mon.-Wed.
Sept. 14 Thurs.
Sept. 14 Thurs.
Sept. 15 and 18..... Fri. and Mon.
Sept. 19 Tues.
Sept. 19 and 20..... Tues. and Wed.
Sept. 21-23 Thurs.-Sat.
Sept. 25 Mon.
Oct. 6 Fri.
Oct. 21 Sat.
Oct. 31 Tues.
Nov. 11 Sat.
Nov. 23-25 Thurs.-Sat.
Dec. 9 Sat.
Dec. 22-Jan. 2 Fri.-Tues.

1962

Classes resume
Master's theses of Feb. candidates due in Dean's Office
Doctoral dissertations of Feb. candidates due in Dean's Office.....
Last day of fall-semester classes.....
Examination period
Advising for freshmen, sophomores, and all new students
Placement tests for entering freshmen.....

Jan. 3 Wed.
Jan. 3 Wed.
Jan. 3 Wed.
Jan. 17 Wed.
Jan. 19-27 Fri.-Sat.
Jan. 22-31 Mon.-Wed.
Jan. 25 Thurs.

SPRING SEMESTER:

Graduate registration *
Qualifying examinations
Undergraduate registration†
Spring-semester classes begin.....
Subjects of Master's theses of June candidates due in Dean's Office.....
Winter Convocation. Holiday.....

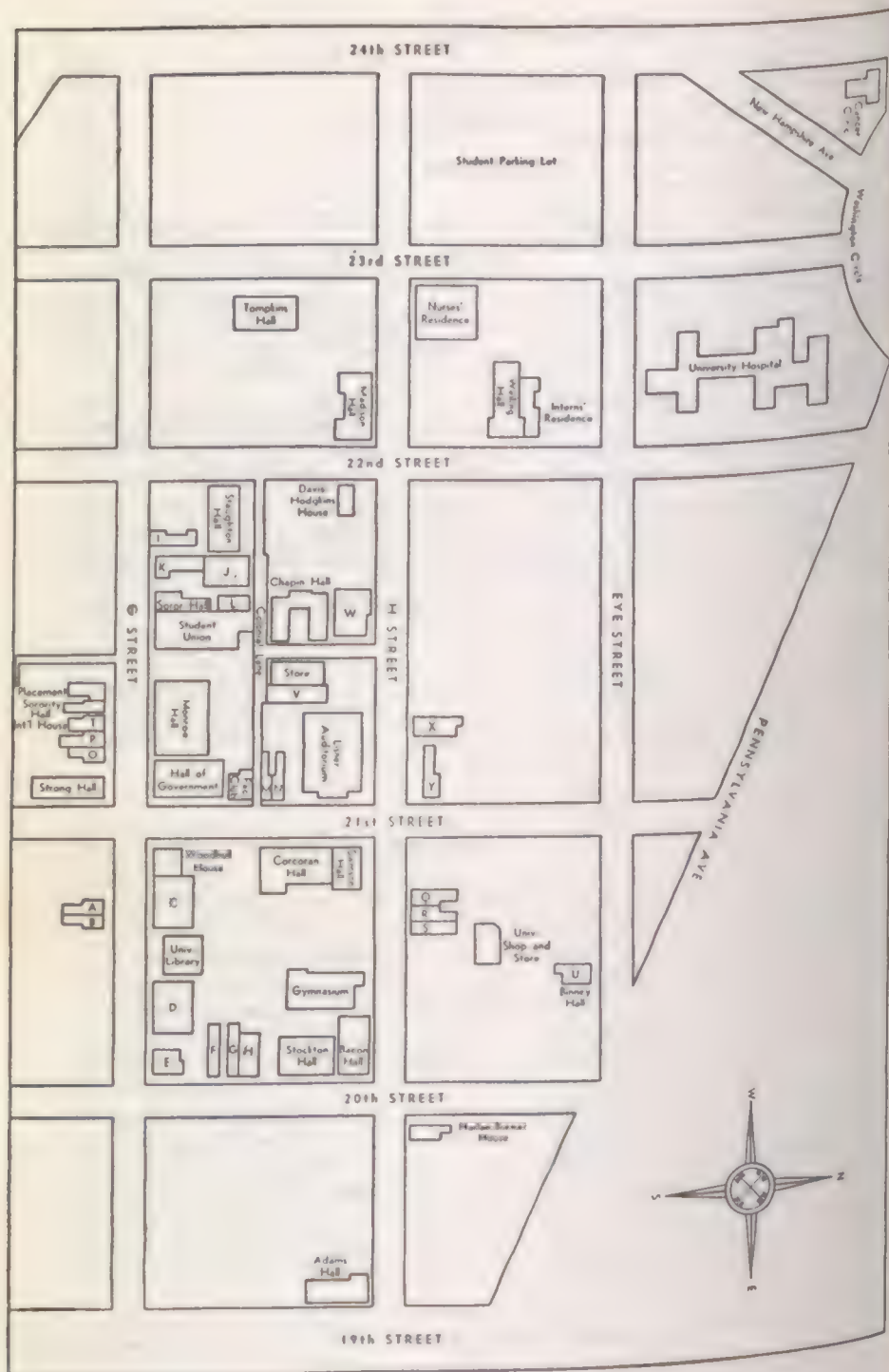
Jan. 30 and 31 Tues. and Wed.
Jan. 31 Wed.
Feb. 1-3 Thurs.-Sat.
Feb. 5 Mon.
Feb. 9 Fri.
Feb. 22 Thurs.

* From 11:00 A.M. to 8:00 P.M.

† September 21 and 22 from 10:00 A.M. to 8:00 P.M.; September 23, from 10:00 A.M. to 1:00 P.M.

‡ February 1 and 2, from 10:00 A.M. to 8:00 P.M.; February 3, from 10:00 A.M. to 1:00 P.M.

| | | |
|--|-------------------|-------------|
| Applications for June graduation due in Registrar's Office | Feb. 28 | Wed. |
| Applications for 1962-63 fellowships and scholarships due | March 1 | Thurs. |
| Graduate Record Examination | April 7 | Sat. |
| Theses and dissertations of June candidates due in Dean's Office | April 9 | Mon. |
| Easter recess | April 20-25 | Fri.-Wed. |
| Last day of spring-semester classes | May 16 | Wed. |
| Examination period | May 18-26 | Fri.-Sat. |
| Memorial Day. Holiday | May 30 | Wed. |
| Baccalaureate Service | June 3 | Sun. |
| Commencement | June 6 | Wed. |
| SUMMER SESSIONS: | | |
| Registration for eight-week term | June 18 | Mon. |
| Classes begin | June 19 | Tues. |
| Independence Day. Holiday | July 4 | Wed. |
| Application for Oct. graduation due in Registrar's Office | Aug. 1 | Wed. |
| Eight-week term ends | Aug. 10 | Fri. |
| Registration for fall semester 1962-63 | Sept. 20-22 | Thurs.-Sat. |



THE BOARD OF TRUSTEES

THE UNIVERSITY

The Board of Trustees of the University is composed of the President of the University ex officio and the following persons by election:

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John Edgar Hoover, LL.M., LL.D.

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John Keown McKee

Benjamin Mosby McKelway, Litt.D.

James Matlack Mitchell, A.M.

*George Edward Muth, A.B., LL.B.

*Frederick A. Reuter, M.D.

*Charles Sylvanus Rhyne, LL.B., D.C.L., LL.D.

Donald D'Arcy Shepard, LL.B.

Carleton D. Smith

Sidney William Souers, A.B., LL.D.

Lewis L. Strauss, Sc.D., LL.D., L.H.D.

I. Corrin Strong, Ph.B., LL.D.

James Edwin Webb, A.B., LL.D.

*Frank Harvey Weitzel, A.B., LL.B.

Alexander Wetmore, Ph.D., Sc.D.

Watson W. Wise, Ph.B.

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Lyman James Briggs, Ph.D., Sc.D., D.Eng., LL.D.

Mrs. Wilbur John Carr

Mrs. Joshua Evans, Jr., A.B., Ed.D.

Ulysses S. Grant, 3d, B.S., Graduate United States Engineers School, LL.D., Sc.D.

Gilbert Grosvenor, A.M., LL.D., Litt.D., Sc.D.

Walter Rupert Tuckerman, A.B., LL.B., LL.D.

Charles Stanley White, M.D., Sc.D.

Lloyd Bennett Wilson

* Nominated by the alumni.

OFFICERS OF ADMINISTRATION *

THE UNIVERSITY

Thomas Henry Carroll, B.S., M.B.A., D.C.S., *President* (February 1, 1961)
Oswald Symister Colclough, B.S., LL.B., LL.D., *Dean of Faculties; Acting President*
(to February 1, 1961)

_____, *Administrative Secretary*

Henry William Herzog, B.S., *Treasurer*

Claud Max Farrington, A.M., *Assistant to the President*

Joseph Young Ruth, A.B., *Director of Admissions*

Frederick Russell Houser, A.M., in Govt., *Registrar; Secretary of the Faculties*

John Russell Mason, A.M., M.S. in L.S., *Librarian; Curator of Art*

William David Johnson, B.S. in B.A., *Comptroller*

Charles William Cole, Ph.D., *Dean of the Summer Sessions*

Benjamin Douglass Van Evera, Ph.D., Sc.D., *Dean for Sponsored Research*

Mitchell Dreesse, Ph.D., *Dean in the Office of the President*

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Don Carlos Faith, Ph.D., *Director of Activities for Men; Director of Veterans Education*

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Alan Thomas Deibert, A.M., *Adviser to Students from Foreign Countries*

Richard Bernard Castell, A.B., M.D., *Director of Health Administration*

Loretta May Stallings, A.M., *Director of Women's Athletics*

Robert Faris, B.S., *Director of Men's Athletics*

Edward Martin Wall, A.B., LL.B., *Director of Air Science*

John Francis Latimer, Ph.D., *Associate Dean of Faculties; University Marshal*

THE SCHOOL OF ENGINEERING

Martin Alexander Mason, B.S. in Eng., Ing.-Dr., *Dean of the School of Engineering*

Carl Hugo Walther, B.E., M.C.E., *Assistant Dean in the School of Engineering*

Jack Edward Walters, M.S. in M.E., Ph.D., *Director of the Engineering Administration Program*

* The Officers of Administration listed here are for the academic year 1960-61.

THE UNIVERSITY

HISTORY AND ORGANIZATION

The idea of a university in the Capital of the Nation was sponsored by George Washington. During his public life he urged the establishment of such an institution; and in his will he left fifty shares of stock in the Potomac (Canal) Company for the endowment of a university in the District of Columbia "to which the youth of fortune and talents from all parts thereof might be sent for the completion of their Education in all the branches of polite literature;—in arts and Sciences,—in acquiring knowledge in the principles of Politics & good Government".

The George Washington University operates under a charter granted by an act of Congress of February 9, 1821, to Columbian College in the District of Columbia. In 1873 the name was changed to "Columbian University" and in 1904 to "The George Washington University".

The University as it is now organized consists of the Junior College, comprising the work of the freshman and sophomore years; Columbian College, the senior college of liberal arts, which offers work leading to the Bachelor's and Master's degrees; the Graduate Council, which offers work leading to the degree of Doctor of Philosophy; the professional schools, which include Medicine; Law; Engineering; Pharmacy; Education; and Government, Business, and International Affairs; the College of General Studies; the Division of University Students; the Division of Special Students; the Division of Air Science; and the Summer Sessions.

The George Washington University is a privately endowed University located on a well planned campus in the center of Washington within a few blocks of the White House. The government and educational management of the University are vested in a self-perpetuating Board of Trustees, with the President of the University serving as an ex officio member of the Board.

ACADEMIC STATUS

The George Washington University is accredited by its regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The School of Engineering is on the accredited list of the Engineers' Council for Professional Development.

LOCATION

The George Washington University is in downtown Washington four blocks west of the White House and east of the Potomac River with its extensive parkway. Readily accessible to the University are many of the departments of the Government, including the Department of State, the Department of the Treasury, the Department of Justice, the Department of the Army, the Department of the Navy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Department of Labor, as well as the National Archives, the Capitol, the Library of Congress, the National Academy of Sciences, the Pan American Union, the National Gallery of Art, and the Corcoran Gallery of Art.

THE SCHOOL OF ENGINEERING

THE FACULTY AND STAFF OF INSTRUCTION *

EMERITUS FACULTY

CLOYD HECK MARVIN, Ph.D., LL.D., Doctor honoris causa of The George Washington University, *President Emeritus of the University*

BENJAMIN CARPENTER CRUICKSHANKS, B.S. in M.E., *Professor Emeritus of Mechanical Engineering*

FREDERICK MORRIS FEIKER, B.S. in E.E., D.Eng., *Professor Emeritus of Engineering Administration*

ACTIVE FACULTY AND STAFF OF INSTRUCTION

GEORGE ABRAHAM, M.S., *Lecturer in Electrical Engineering*

WILLIAM ALDERSON, M.S. in E.E., *Lecturer in Electrical Engineering*

GALIP MEHMET ARKILIC, Ph.D., *Associate Professor of Civil Engineering*

WILLIAM WALTER BALWANZ, B.E.E., M.S. in E.E., *Lecturer in Electrical Engineering*

KENNETH SEYMOUR COLMEN, B.A.E., Ph.D., *Professorial Lecturer in Engineering Administration*

PAUL ARTHUR CRAFTON, B.M.E., Ph.D., *Professor of Mechanical Engineering*

ROBERT LYLE DEDRICK, M.S.E., *Assistant Professor of Mechanical Engineering*

LOUIS DEPIAN, Ph.D., *Associate Professor of Electrical Engineering*

FREDERICK CHARLES DYER, M.B.A., *Professorial Lecturer in Engineering Administration*

JOHN BEARD ECKER, B.S. in C.E., M.S., *Professor of Engineering Administration*

HOWARD EISNER, B.E.E., M.S., *Lecturer in Electrical Engineering*

CLIFFORD DURAS FERRIS, M.S. in E.E., *Assistant Professor of Electrical Engineering*

RAYMOND RICHARD FOX, M.S. in C.E., *Associate Professor of Civil Engineering*

MARTIN AARON GARSTENS, A.M., Sc.D., *Lecturer in Engineering*

JOHN FRANCIS GREENSLADE, B.S., M.E.A., *Assistant Professor of Engineering Administration*

NELSON THOMAS GRISAMORE, Ph.D., *Associate Professor of Electrical Engineering; Executive Officer of the Department of Electrical Engineering*

MILTON GUSSOW, B.S. in E.E., M.S., *Lecturer in Electrical Engineering*

FRANKLIN PORTER HALL, Ph.D., *Professorial Lecturer in Engineering Administration*

KEITH CYRIL HARDER, Ph.D., *Professorial Lecturer in Engineering Administration*

FOREST KLAIRE HARRIS, Ph.D., *Professorial Lecturer in Electrical Engineering*

ROBERT AARON HECHTMAN, M.S. in C.E., Ph.D., *Professor of Civil Engineering; Executive Officer of the Department of Civil Engineering*

LAURENCE HEILPRIN, Ph.D., *Professorial Lecturer in Engineering Administration*

HERMAN HEDBERG HOBBS, Ph.D., *Associate Professor of Physics*

JOHN KAYE, M.S. in M.E., *Associate Professor of Engineering Administration*

* The Staff of Instruction listed here is for the academic year 1960-61.
The President of the University, the Dean of Faculties, the Dean of the School and the Assistant Dean in the School, the Registrar of the University, the Director of Admissions of the University, the Professors, Associate Professors, Assistant Professors, and Instructors constitute the Faculty.

THOMAS PHILLIP GEORGE LIVERMAN, Ph.D., *Professor of Mathematics*
 KERMIT MILTON LOVEWELL, B.S. in E.E., *Lecturer in Electrical Engineering*
 GEORGE VICTOR LUCKY, B.C.E., *Instructor in Civil Engineering*
 MARTIN ALEXANDER MASON, B.S. in Eng., Ing.-Dr., *Professor of Civil Engineering;
 Dean of the School of Engineering*
 FLORENCE MARIE MEARS, Ph.D., *Professor of Mathematics*
 ARNOLD CHARLES MELTZER, B.S.E., *Instructor in Electrical Engineering*
 JAMES RUSSELL MILES, SR., A.B., M.E.A., *Lecturer in Engineering Administration*
 ROBERT HAMILTON MOORE, Ph.D., *Professor of English Composition*
 ROBERT MILTON MOORE, B.S.E., *Instructor in Mechanical Engineering*
 ALBERT CHRISTIAN MURDAUGH, B.S., M.S. in Met.E., *Associate Professor of Mechanical Engineering*
 CHARLES RUDOLPH NAESER, Ph.D., *Professor of Chemistry*
 MORRIS SOLOMON OJALVO, M.M.E., *Associate Professor of Mechanical Engineering*
 GEORGE PIDA, B.E.E., *Lecturer in Electrical Engineering*
 FRANK MILLER REYNOLDS, LL.M., B.S., *Professorial Lecturer in Engineering Administration*
 DEIRILLE CONWAY ROHLFS, B.E.E., M.S. in Eng., *Lecturer in Electrical Engineering*
 LOUIS SAMUEL ROTOLO, B.S. in E.E., *Lecturer in Electrical Engineering*
 LEWELLYN ADAM RUBIN, M.S. in E.E., *Assistant Professor of Electrical Engineering*
 ROBERT IRVING SARBACHER, Sc.D., E.E., *Professorial Lecturer in Engineering Administration*
 PETER HANS SAWITZ, M.S. in E.E., *Lecturer in Electrical Engineering*
 LEWIS SLACK, Ph.D., *Professor of Physics*
 NATHANIEL STEWART, M.S., Ed.D., *Professorial Lecturer in Engineering Administration*
 HOWARD LIVINGSTON STIER, Ph.D., *Professorial Lecturer in Statistics (Engineering Administration Program)*
 SANFORD THOMPSON, Ph.D., *Professorial Lecturer in Mechanical Engineering*
 JACK EDWARD WALTERS, M.S. in M.E., Ph.D., *Professor of Engineering Administration; Director, Engineering Administration Program*
 CARL HUGO WALTHER, B.E., M.C.E., *Professor of Civil Engineering; Assistant Dean in the School of Engineering*
 DAVID GOVER WHITE, B.Chem.Eng., Ph.D., *Associate Professor of Chemistry*
 THOMAS BREEDEN WIGGINS, B.E.E., *Associate in Electrical Engineering*
 ROBERT JAMES WILSON, A.M., Ed.D., *Professorial Lecturer in Engineering Administration*

ASSISTANTS IN INSTRUCTION

RICHARD EDWARD DAME, B.C.E., *Graduate Teaching Assistant in Civil Engineering*
 SOLOMON SIDNEY FINEBLUM, B.M.E., *Graduate Teaching Assistant in Mechanical Engineering*
 GEOFFREY UMIO UYEHARA, A.B., *Graduate Teaching Assistant in Electrical Engineering*

ADMINISTRATIVE ASSISTANTS

Gladys May Lacey, *Secretary to the Dean*
 Maria Henrietta Ruyter, *Secretary*
 Alice Anania Stepanian, *Clerk-Typist*
 Anne Louise Rocca, *Clerk-Typist*

COMMITTEES*

THE DEAN'S COUNCIL†

1962: A. C. Murdaugh, J. E. Walters; 1963: P. A. Crafton, N. T. Grisamore;
1964: R. R. Fox, C. R. Naeser

COMMITTEE ON ADMISSION AND ADVANCED STANDING

C. H. Walther (*Chairman*), R. R. Fox, M. S. Ojalvo, L. A. Rubin

COMMITTEE ON SCHOLARSHIP

R. R. Fox (*Chairman*), R. L. Dedrick, C. D. Ferris

COMMITTEE ON GRADUATE STUDIES‡

M. A. Mason (*Chairman*), G. M. Arkilic, Louis dePian, M. S. Ojalvo, J. E. Walters

COMMITTEE ON RESEARCH

N. T. Grisamore (*Chairman*), R. L. Dedrick, A. C. Meltzer

GENERAL INFORMATION

INTRODUCTORY

The School of Engineering was organized October 1, 1884 as the Corcoran Scientific School of Columbian University and was situated in the University Building then at 15th and H Streets, NW. The school was named in honor of William W. Corcoran, Trustee and President of the Corporation from 1869 to 1888. Day and evening courses were offered in Literature, Science, and Technology and led to the degrees of Bachelor of Science, Civil Engineer, Mechanical Engineer, and Mining Engineer. The school was among the first to accept women for degree candidacy in engineering.

In 1903 the Corcoran Scientific School, the School of Graduate Studies, and the Columbian College were merged into a single Department of Arts and Sciences. Engineering degrees were made graduate.

Administrative changes led to The Washington College of Engineering being initiated in 1905 as one of the several semi-independent undergraduate colleges of the University, each with its own Board of Trustees. The College provided instruction leading to undergraduate degrees in engineering and architecture.

In 1909 the name of the College was changed to the College of Engineering and Mechanic Arts, and the curricula were revised to give the student a thorough understanding of the theory underlying engineering practice. Emphasis was placed on the development of a knowledge of scientific principles upon which the student could build and by which he might solve new problems as they are met in practice.

The name of the school was changed again in 1914 to the College of Engineer-

* The Dean of the School and the Assistant Dean in the School are members ex officio of all committees. Membership of committees listed here is for the academic year 1960-61.

† Elected by the Faculty.

‡ Appointed by the Dean upon recommendation of the Faculty.

ing and later to the School of Engineering. Architecture was dropped from the curriculum and degrees were limited to the field of engineering. However, the primary emphasis upon principles rather than technology which had characterized the School since 1903 was continued and has remained to this day as one of the important distinguishing features of the School.

The location of the School of Engineering in the nation's capital makes available a group of outstanding engineers and scientists as lecturers. It is traditional for the School to include these eminent professional specialists among the staff of instruction.

Since 1884 courses of instruction have been open to both men and women.

OBJECTIVE

The objective of the School of Engineering is to produce graduates who possess knowledge and understanding of the fundamental scientific principles in their fields of study; some skill in their application; and an attitude of responsibility toward society and the engineering profession.

ORIENTATION PROGRAM*

Students in the School of Engineering participate in the Orientation Program of the University, which is held during the week preceding registration for the fall semester. Events of the program include an advising period when members of the Faculty in the School of Engineering are available for personal interviews to assist students in planning their programs to best prepare them for ultimate goals; an Orientation Assembly, required of all new students; a Curriculum Assembly, for guidance in the selection of courses for the coming semester; placement tests for new students who do not have advanced standing in mathematics and English; qualifying examinations for students who wish to waive curriculum requirements or qualify for advanced standing; scheduled social events; and the opportunity to discuss with older students and with staff members concerned with student activities the extracurricular program of the University, so that a wise and rewarding selection may be made.

The placement tests are required and are scheduled during Orientation week for students entering the School of Engineering, and again during the week prior to the spring registration for students entering at that time. The results are available to students and advisers before registration as a guide to class placement. Students shown by such tests to be inadequately prepared are advised to take remedial work before undertaking Engineering courses in areas of deficiency.

PROGRAMS OF STUDY

Programs of undergraduate study are offered leading to the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, and Bachelor of Science in Engineering (with optional areas of concentration).

Graduate work is offered under the supervision of the Committee on Graduate Studies, leading to the degrees of Master of Science in Engineering, Master of Engineering Administration, and Doctor of Science.

* See the calendar for dates of scheduled events.

HOURS OF INSTRUCTION

Classes are scheduled in the morning, afternoon, and evening. By taking evening and summer classes and extending the time of study beyond the usual four years, a part-time student may complete the requirements for a degree.

VETERANS EDUCATION

The Office of Veterans Education of the University is a service bureau for eligible persons interested in studying at the University. It acts in a liaison capacity between the University and the Veterans Administration. Those who are eligible are advised to consult this Office about the educational program of the University and the procedure for securing benefits, before applying to the Veterans Administration for certification. The Veterans Administration is on Constitution Avenue at Twentieth Street NW., Washington 25, D.C.

PUBLIC LAW 634

(War Orphans' Educational Assistance Act)

A child of a person who died of a disease or injury incurred or aggravated while on active duty in the Armed Forces during World War I, World War II, or the Korean Conflict may be eligible for educational assistance under this Act, if certain age requirements are met. In the case of a child who has not reached the age of majority, his guardian must make application for him to the Veterans Administration.

PUBLIC LAW 190

(World War II GI Bill Extension)

The educational benefits for World War II veterans terminated July 25, 1956, except that persons enlisting or reenlisting in the Armed Forces between October 6, 1945, and October 5, 1946, may count the entire period of such enlistment or reenlistment as war service for purposes of GI Bill benefits. Such enlistees have four years from the date that enlistment ended to begin training and nine years from that separation date to complete training under this provision.

PUBLIC LAW 550

(Korean GI Bill)

To be eligible under this Law, a veteran must have been in service between June 27, 1950 and January 31, 1955, and must no longer be on active duty.

At least thirty days prior to registration the veteran should apply to the Veterans Administration for a Certificate for Education and Training, for presentation to the University Office of Veterans Education at the time of registration. A photostatic copy of his DD214 must accompany the original application for certification.

PUBLIC LAWS 16 AND 894

(Vocational Rehabilitation)

Disabled veterans desiring vocational rehabilitation under either Law should apply to the Veterans Administration for approval of their training objectives at least sixty days prior to registration.

SERVICE SCHOOL CREDITS

A limited amount of credit earned in service schools since 1941 may be considered for assignment to qualified degree candidates in the Junior College, Columbian College, the School of Engineering, and the School of Government. Veterans should submit to the Director of Admissions photostatic copies of their service school records, indicating courses successfully completed with sufficient identification of the course to locate it in the Guide to Evaluation of Educational Experience in the Armed Forces.

AIR FORCE RESERVE OFFICERS' TRAINING CORPS

The Air Force Reserve Officers' Training Corps (Air Force ROTC) unit was established at the University in 1951 under authority of Section 40-47C, National Defense Act of June 3, 1916, as amended. Air Force personnel, approved by the President of the University, are assigned by the Department of the Air Force to supervise and conduct the Air Force ROTC program.

The mission of the Air Force ROTC is to develop in selected university students, through a permanent program of instruction, those qualities of leadership and other attributes essential to their progressive advancement to positions of increasing responsibility as commissioned officers in the United States Air Force. Classroom instruction and leadership training are provided to develop in the student the knowledge and the attributes of character, personality, and leadership required of commissioned officers.

COURSE OF STUDY

The course of study is divided into the basic course covering the first two years and the advanced course covering the junior year, summer training unit, and senior year.

Many academic subjects in the University's liberal arts program have a direct relationship to military as well as to civilian careers. Consequently, some of these have been substituted for academic courses included in standard Air Force ROTC curricula. Courses have been carefully selected to avoid duplication in instruction and to provide practical training in organization, leadership, and discipline, which will be of value in industrial or professional careers. The duties and responsibilities of commissioned officers, oral and written expression, and the techniques of problem solving are emphasized throughout the course, both in theory and practice.

Cadets in the advanced course receive subsistence allowances from the Government totaling approximately \$500, which is exempt from income tax. During the period of summer training, cadets receive \$75 a month, food, lodging, and travel expense. Uniforms, textbooks, and training materials are provided for all Air Science courses at no expense to the cadet.

ELIGIBILITY REQUIREMENTS

Enrollment in the Division of Air Science basic course is open to all men students who are at least 14 years of age, physically fit, of good character, and candidates for a Bachelor's degree. All students enrolling in the basic course are required to successfully complete the two-year course as a prerequisite to grad-

uation from the University. Upon successful completion of the basic course, a cadet may apply for enrollment in the advanced course.

A cadet enrolled in the advanced course must successfully complete the junior- and senior-year Air Science curricula and summer training unit as a prerequisite to graduation. Upon graduation he is obligated to accept a commission in the United States Air Force, if tendered. Any cadet who for academic, physical, or other reasons becomes disqualified for a commission is relieved of this obligation. Cadets enrolled in the category leading to pilot training may be required to pursue a 35-hour course of flying instruction during the senior year. This flying instruction is provided by a Civil Aeronautics Administration approved school at government expense, and leads to qualification for a private pilot's certificate.

MILITARY SERVICE DELAY

Deferment from induction under the Selective Service Act of 1951 may be granted to selected cadets within authorized quotas. Normally, a cadet is not considered for draft deferment until he has completed one semester's work in the University, with a quality-point index of at least 2.00. A cadet's deferment is subject to withdrawal if his quality-point index falls below 2.00.

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary school;* (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.† All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his

* A charge of \$2 for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for this purpose.

† See Rule (5) for exception.

connection with the University is ineligible for medical benefits: (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the physical education departments.

LIVING ACCOMMODATIONS

The University maintains four residence halls. Meals are served at the Student Union.

Admission to the University does not include a room reservation. A separate application for a room should be made well in advance (for the fall semester by May first, for the spring semester by January first). Forms for application, together with detailed information, may be obtained from the Director of Activities for Women or the Director of Activities for Men.

Information concerning private rooming and boarding facilities near the University may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

All girls (except freshmen) under the age of twenty-one, who are enrolled for twelve or more semester hours of academic work at the University and who are not living with their parents or relatives may live outside the dormitories only with the permission and approval of the Director of Activities for Women, upon receipt of written requests from parents. In no case will permission be granted for such girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Freshman girls may be domiciled outside the dormitory only with their parents or with immediate relatives with the written approval of their parents.

Women Students.—The Hattie M. Strong Hall provides single rooms at \$45 a month and double rooms at \$40 a month a person.

The Dolly Madison Hall provides double rooms at \$40 a month a person.

Men Students.—Welling Hall provides double rooms at \$30 a month a person.

The John Quincy Adams Hall provides 69 double rooms each with study alcove and bath. Rooms rent at \$40 a month a person.

Dormitory payments are due and payable in advance on the first day of each month. A student who fails to meet payments when due, but who makes his payment from the tenth to the fifteenth, inclusive, of the month in which payment is due, is charged a service fee of \$2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued rent and a reinstatement fee of \$5.

RELIGIOUS LIFE

The University recognizes the contribution that religion makes to the life of its students and encourages them to participate in the various religious organizations of their own choice. Catholic, Jewish, and Protestant bodies sponsor these groups and form a link between the University and the religious community. The advisers of the religious organizations are available for counseling.

UNIVERSITY CHAPEL

The University Chapel is a nonsectarian service of worship for the University community. The service is held Wednesday of each week from 12:10 to 12:30 o'clock at 1906 H Street NW. Among the guest speakers are representative clergymen of Washington. The Director of Chapel is available for counseling on personal problems.

THE PLACEMENT OFFICE

The Placement Office, 2114 G Street NW., provides assistance to students and alumni seeking full-time, part-time, temporary, or permanent employment. The Office maintains a registry of positions available in many fields, both locally and nationally, and refers qualified applicants for consideration. The Office administers the On-Campus Industrial and Government Recruitment Interview Program for seniors and graduate students, in which well over 150 private companies, as well as certain government agencies, participate. This program offers employment opportunities to persons seeking careers.

Students and alumni interested in placement are asked to register in person at the Office and to select from written descriptions of current openings positions for which they wish referral. Those interested in planning careers are invited to study the information on career fields and the brochures of business and industrial organizations, government agencies, etc., which are on display in advance of campus visits by recruiting officers. The services of the Counseling Center are available to students and alumni wishing career guidance.

The Placement Office is open from 9:00 A.M. to 5:00 P.M., Monday through Friday.

THE TESTING AND COUNSELING CENTER

The Testing and Counseling Center, 718 Twenty-first Street NW., offers services which are available to students enrolled in the University, to high school students, and to adults of the community.

The services are designed to assist individuals in the evaluation of their educational and vocational potentialities and objectives, diagnose academic difficulties, provide educational and vocational literature and information, and refer individuals to qualified agencies for assistance with problems not handled by the Center.

The Center provides special testing services including: diagnostic tests prescribed by the School of Engineering, admissions tests for the University and for other educational institutions, and tests for business and industry.

Fees.—Except for specialized testing, the fee covers testing and counseling based on the results of the tests. For students who are currently registered as degree candidates in the University, the fee is \$7.50; for students currently enrolled in the University but not as degree candidates, the fee is \$30; for graduates of the University, \$30; for community clients under twenty-one years of age, \$35; for community clients twenty-one or over, \$45. Fees for specialized testing are dependent upon the services involved. All fees are payable at the Office of the Center.

STUDENT UNION

The Student Union, 2125 G Street NW., is the center for student life. From the cafeteria on the first floor to the reading room on the fourth floor, it is well planned to meet the students' need for meals, study, recreation, and activities. In

addition to the recreation lounge and social lounge the Student Union provides office space for the Student Council and for the other major student organizations.

The Student Activities Office, also in the Student Union, has available information concerning the student organizations and campus events.

DAVIS-HODGKINS HOUSE

The Davis-Hodgkins House, 731 Twenty-second Street NW., is the engineering student center, providing lounges, reading rooms, and student organization offices. The House provides convenient, comfortable facilities for the exchange of ideas and good fellowship among student engineers.

INTERNATIONAL HOUSE

The International House, 2110 G Street NW., is the social center for students from foreign countries. A series of teas, dances, and other forms of entertainment, and the use of club rooms and lounge enable students to become acquainted and feel at home in the University.

The International Students' Society welcomes as members students from other lands as well as North American students.

The Adviser to Students from Foreign Countries, whose office is in International House, is available for advice and guidance.

STUDENT ACTIVITIES

DIRECTORS OF STUDENT ACTIVITIES

The University maintains the offices of the Director of Activities for Men and the Director of Activities for Women, for the guidance of students in all non-academic phases of student life, such as student activities, social life, and housing. The directors are available for individual counseling concerning personal adjustment to university life.

STUDENT GOVERNMENT

Student Council.—The Student Council, which is elected annually by the Student body, is responsible for the conduct of student activities.

Committee on Student Life.—The Committee on Student Life is the judicial branch of the student government. It is composed of not more than seven members of the faculty, two of whom are the Director of Activities for Men and the Director of Activities for Women, appointed by the President of the University, and the following members: President of Student Council, an Editor of the *Hatchet*, President of Mortar Board, President of Omicron Delta Kappa, President of the Interfraternity Council, and President of Panhellenic Council. This Committee has the power to review the acts of all student organizations, including the Student Council, and set aside acts that are contrary to established policy and regulations of the University or the Committee. It is granted authority to approve or disapprove the establishment of any proposed organization on campus. No student club or society (except social fraternities, sororities, scholastic honor societies, religious or professional clubs or societies) organized as a branch or affiliate of a non-George Washington University organization will be recognized by the Committee on Student Life.

ELIGIBILITY FOR STUDENT ACTIVITIES

Any student registered in the University is eligible to participate in nonathletic student activities of the University; however, a student having a scholastic average of less than 2.00 is not eligible to be:

1. A member of the Band, Dance Production groups, Enosinian Debate Society, Glee Club, Cheerleaders, Student Council, Religious Council, Panhellenic Council, Interfraternity Council, Engineers' Council, Student Life Committee, Adams Hall Council, Madison Hall Council, Strong Hall Council, or any publications staff
2. An officer, permanent committee chairman, or member of the executive board of any activity.

The rules and policies of the Southern Conference govern participation in intercollegiate athletics.

THE ENGINEERS' COUNCIL

The Engineers' Council is the student governing body for the School of Engineering, composed of two elected representatives from each year class and from the graduate student body, one representative from each student organization in the School, the Business Manager of the *Mecheleciv*, and the House Manager of the Davis-Hodgkins House. The purpose of the Council is to provide liaison between the student body of the School of Engineering and the Faculty, Administration, and Student Government of the University in all matters affecting the general interests and welfare of the student body, the School of Engineering, or the University. The Council is maintained financially by the Engineers' Council Fee paid by each student in the School of Engineering, and sponsors the engineers' student magazine, *Mecheleciv*; the Annual Engineers' Mixer, Engineers' Banquet and Ball, and the Annual Christmas Tree Ceremony in the University Yard. Council meetings are open to all students in the School of Engineering.

The Council acts as the directing body for *Mecheleciv*, which is published six times a year and is sent free to all engineering students. This magazine includes campus and alumni news, a calendar of events, news of the student organizations, and articles on engineering by students and faculty members. The magazine is published by a student Board of Editors and a volunteer student staff.

The control and administration of all student activities are outlined in a separate bulletin.

SPORTS ACTIVITIES

The University is a member of the Southern Conference and the National Collegiate Athletic Association. Its teams participate in intercollegiate contests in football, basketball, baseball, tennis, golf, rifle, sailing, and crew.

The University maintains a complete program of intramural sports for both men and women. The men's program is conducted by the Intramural Council. The Women's Athletic Association and Intersorority Athletic Board cooperate with the departments of Physical Education in conducting the women's intramural and informal extra-mural sports program in tennis, hockey, basketball, rifle, swimming, golf, bowling, and badminton.

ARTS

Interested students may participate in dance, drama, forensics, and music through the following organizations: Dance Production Groups I, II, III; Enosinian Debate Society; University Dramatic Production Group; and University Glee Club. Each of these groups presents programs during the academic year.

With the cooperation of the Curator of Art, an annual student art exhibit is presented.

SCHEDULED EVENTS

Colonial Program.—The Student Council sponsors a series of ten cultural programs to which all students are invited.

Recreation Program.—The Student Council and the Dance Production Groups arrange dances—square, folk, and social—at frequent intervals for all students.

Engineers' Mixers.—At the beginning of each semester the Engineers' Council sponsors a program of orientation, good fellowship, and entertainment to introduce new students.

Homecoming.—Scheduled about the middle of the fall semester, Homecoming is the primary festive period of the school year. It includes the annual Pep Rally and Variety Show, the homecoming football game, and the homecoming dance.

Religion In Life Week.—Observed during the week of Thanksgiving, Religion In Life Week includes special lectures, classroom lectures, and fraternity and sorority discussion groups. Religion In Life Week is sponsored by the University Chapel in cooperation with the Committee on Religious Life and the religious organizations.

Holiday Season.—The University traditionally greets the holiday season with appropriate ceremonies including the lighting of the Christmas tree (given and decorated by the School of Engineering), the singing of Handel's Messiah, and the observance of a special Christmas service at the University Chapel.

Engineers' Banquet.—In the spring the Engineers' Council sponsors the Engineers' Banquet and Ball, a social event for students and alumni, featuring recognition of student achievements during the year.

Career Conference.—Under the sponsorship of the Student Council, guest speakers from many professions discuss with students the potentialities of vocations available on graduation.

May Day.—This is the traditional time for the award of honors in student activities. Mortar Board and Omicron Delta Kappa announce and present their new members.

The Colonial Cruise.—This afternoon and evening cruise on the Potomac in the late spring is open to students, alumni, and faculty, who picnic, dance, and engage in games and athletic contests.

STUDENT ORGANIZATIONS

HONOR SOCIETIES

Sigma Xi.—A national scientific honor society, the purpose of which is to encourage original investigation in science pure and applied. Outstanding graduate students in the sciences are eligible for full membership, and undergraduates who have shown marked ability in research may be elected to associate membership.

Omicron Delta Kappa.—A national fraternity emphasizing leadership in extra-curricular activities.

Order of Scarlet.—A service honorary society for sophomore and junior men.

Phi Eta Sigma.—A national fraternity, established to encourage and reward high scholarship and attainment, membership in which is limited to those freshman men who attain a scholastic average of at least 3.50.

Sigma Epsilon.—A local engineering honor society established to recognize distinguished scholarship and exemplary character. Members are elected from the top one-eighth of those students in their next-to-last calendar year before graduation and from the top one-fifth of those students in their last calendar year.

Sigma Tau.—A national engineering fraternity, the purpose of which is to recognize scholarship and professional attainment.

PROFESSIONAL ORGANIZATIONS

American Institute of Electrical Engineers—Institute of Radio Engineers (Student Chapter).—Membership open to candidates for an electrical engineering degree.

American Society of Civil Engineers (Student Chapter).—Membership open to students who are candidates for a civil engineering degree or the degree of Bachelor of Science in Engineering.

American Society of Mechanical Engineers (Student Chapter).—Membership open to candidates for the degree of Bachelor of Mechanical Engineering.

Theta Tau (Gamma Beta Chapter).—A national professional (engineering) fraternity. Membership by invitation to outstanding students who have completed successfully at least the freshman year in the School of Engineering.

SOCIAL FRATERNITIES

Sigma Chi, Kappa Sigma, Phi Sigma Kappa, Sigma Alpha Epsilon, Sigma Phi Epsilon, Phi Sigma Delta, Sigma Nu, Tau Kappa Epsilon, Pi Kappa Alpha, Tau Epsilon Phi, Alpha Epsilon Pi, Delta Tau Delta.

SOCIAL SORORITIES

Pi Beta Phi, Chi Omega, Sigma Kappa, Alpha Delta Pi, Delta Zeta, Kappa Delta, Phi Sigma Sigma, Zeta Tau Alpha, Kappa Kappa Gamma, Delta Gamma, Kappa Alpha Theta, Alpha Epsilon Phi.

RELIGIOUS ORGANIZATIONS

Baptist Student Union, B'nai B'rith Hillel Foundation, Canterbury Association, Christian Science Organization, Eastern Orthodox Club, Lutheran Student Association, Newman Club, Religious Council, Student Christian Fellowship, Unitarian Club, United Christian Fellowship, Wesley Foundation.

STUDENT PUBLICATIONS

Amicus Curiae (Law School publication), *The Cherry Tree* (the annual), *The University Hatchet* (weekly newspaper), *The George Washington Law Review*, *Mecheleciv* (engineers' publication), *The Percolator* (pharmaceutical publication), *The Potomac* (literary magazine).

OTHER ORGANIZATIONS

Adams Hall Council, Alpha Theta Nu (scholarship winners), Big Sisters, Cheerleaders, Colonial Boosters, Colonial Campus Party, Flying Sponsors, Interfraternity Council, Interlaw Fraternity Council, International Relations Club, International Students' Society, Junior Panhellenic Association, Madison Hall Council, Old Men, Senior Panhellenic Association, Strong Hall Council, Student Council, Student Legal Aid Society, University Band, Wandering Greeks, Writers' Club.

ADMISSION

The School of Engineering accepts men and women.

Students may enter at the beginning of the fall semester, the spring semester, or the Summer Sessions.

APPLICATION FOR ADMISSION

Forms for application for admission are available at the Office of the Director of Admissions 2021 G Street NW., Washington 6, D. C.; telephone: FEderal 8-0250, extension 344. The completed form should be returned to the Office of the Director of Admissions, with an application fee of \$10 for a degree candidate; \$5 for a nondegree candidate. The degree candidate must attach to his application a recent photograph, signed by him.

Applications should be filed by July 1 for the fall semester, January 1 for the spring semester, and May 1 for the Summer Sessions.

An applicant from secondary school must send the high school record form provided by the University to his high school principal with the request that the completed form be mailed to the Office of the Director of Admissions.

The applicant must request the College Entrance Examination Board to send to the Office of the Director of Admissions the scores of all College Entrance Examination Board Scholastic Aptitude tests and Achievement tests taken. Arrangement for tests is the responsibility of the applicant and should be made with the College Entrance Examination Board, 20 Nassau Street, Princeton, New Jersey, not less than one month before the date of the test. On the application for the test, the student should specify that the scores be sent to the Director of Admissions, The George Washington University, Washington 6, D. C.

An applicant who has attended one or more institutions of higher learning must request each registrar to mail to the Office of the Director of Admissions a transcript of his record, even though credits were not earned. An honorable dismissal is required from the institution last attended.

The appropriate report of Graduate Record Examinations, when available, should accompany application for admission to graduate degree candidacy.

APPLICATION FOR READMISSION

A student who has previously registered in the University, but who did not attend during the semester prior to registration (summer session excluded) must file an application for readmission in advance of registration. If the student applies as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must have completed, official transcripts sent to the Office of the Director

of Admissions from each institution attended before his application will be considered. Applications for readmission are considered on the basis of regulations currently effective.

ENTRANCE REQUIREMENTS

Good character and academic background appropriate for the program of studies contemplated are required.

FOR UNDERGRADUATE STUDY

For the Degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, Bachelor of Science in Engineering.—Admission is based on the following factors:

1. An acceptable certificate of graduation from an accredited high school showing a minimum of fifteen "units" *
2. The principal's statement that the applicant is prepared to undertake college work
3. Scores on the Scholastic Aptitude Test of the College Entrance Examination Board.

The qualifications of applicants who, because of unusual circumstances, do not meet the above requirements will be considered by the Committee on Admission and Advanced Standing. The Committee may prescribe admission tests when necessary.

Nine and one-half of the fifteen units required for entrance must be distributed as follows: three in English, two in algebra, one in plane geometry, one-half in plane trigonometry, one in physics or chemistry, and two in one foreign language or history. A graduate of an approved high school who does not offer for admission the particular subjects required for the engineering curriculum, but who does present not less than fifteen acceptable units, may be admitted on condition, if such deficiency in the distribution of units does not exceed two units.

It is recommended that *both* physics and chemistry be studied in high school. Study of these sciences contributes to the student's general education, aids in his choice of a career, and affords a qualitative measure of his ability and potential for engineering study. Superior students are encouraged to begin collegiate study of physics or chemistry at the highest level consistent with their preparation, by the use of waiver examinations.

The study of solid geometry is recommended, in order that the student may have a firm foundation for his collegiate studies in mathematics.

ADVANCED STANDING

CREDIT FOR ADVANCED PLACEMENT EXAMINATIONS

Advanced standing may be granted for study at the collegiate level in advanced courses in an approved secondary school, if substantiated by satisfactory performance in the Advanced College Placement Examination. Arrangement for the examination is the responsibility of the applicant and should be made with the College Board Advanced Placement Examinations, Educational Testing Service, 20 Nassau Street, Princeton, New Jersey.

The applicant must request the examining service to submit the test papers and scores to the Office of Admissions. Consideration is given to both the quality of

* A unit represents a year's study in a secondary school subject, including in the aggregate not less than 120 sixty-minute periods of prepared classroom work.

performance on the examination and the quality and content of the course of study completed by the applicant.

Total credit that may be so granted is ordinarily limited to 15 semester hours, not more than 8 semester hours of which may be in any one examination area. In exceptional cases these limits may be exceeded, but in no case will the credit granted exceed 30 semester hours.

Credit from Higher Institutions

Advanced standing may be granted for work successfully completed at accredited institutions of higher learning. Credit will be granted for transferred work only when it meets the requirements for the degree sought at this University, and subject to the general University regulations concerning satisfactory subsequent work.

FOR GRADUATE STUDY

For regulations concerning admission to graduate study toward the degrees of Master of Science in Engineering and Master of Engineering Administration, see page 34; toward the degree of Doctor of Science, see page 38.

For Degree Candidacy

For regulations concerning admission to candidacy for the Master's degrees, see pages 34-35.

REGISTRATION

A student may not register for classes until the Office of the Director of Admissions has approved his admission to the University.

A student who has previously matriculated in the University, but who did not attend during the semester prior to registration, must file an application for re-admission well in advance of registration.

Registration is for the semester unless otherwise indicated on the registration paper. No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in the School of Engineering and in another institution or another division of this University without the permission of the Dean. Allowance of credit for work done concurrently will be at the discretion of the Committee on Admission and Advanced Standing.

Registration in the School of Engineering entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library facilities; (4) gymnasium privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to *Mecheleciv*, the engineers' student magazine; (7) subscription to the *University Hatchet*, the student newspaper; (8) admission to University debates; (9) medical attention and hospital services as described under Health Administration, pages 10-11. These privileges, except for the issuance of transcripts, terminate, and a student is no longer a residence, when he withdraws or is dismissed from the University.

FEEES AND FINANCIAL REGULATIONS

| | |
|---|---------|
| Application fee, charged each applicant for admission as a degree candidate, nonrefundable | \$10.00 |
| Application fee, charged each applicant for admission as a nondegree candidate, nonrefundable | 5.00 |

Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable. 5.00

Tuition Fees:

| | |
|---|------------|
| For each semester hour for which the student registers (except for courses in Departments of Instruction in the School of Engineering, for courses in the College of General Studies Off-Campus Division, and for work toward a Master's degree in Engineering) | 24.00 |
| For each semester hour for which the student registers for courses in Departments of Instruction in the School of Engineering. | 25.00 |
| For the degree of Master of Engineering Administration: | 700.00 |
| For work leading to and including the Comprehensive Examination† | 800.00 |
| For the degree of Master of Science in Engineering: | 800.00 |
| For work leading to and including the Comprehensive Examination† | 1,200.00 |
| For the degree of Doctor of Science: | 1,200.00 |
| For work leading to and including the Qualifying Examination. | 25.00 |
| For work leading to and including the final examination. | 6.00-12.00 |
| Graduation fee | 10.00 |
| Admission Tests (when required) | 5.00 |
| Graduate Record Examination fee (to cover two examinations), charged each candidate for a Bachelor's degree at the time of registration for the final semester | 2.00 |
| Late-registration fee, charged each student who fails to register within the designated period | 5.00 |
| Change fee, charged each student for each change in program involving one or more than one course | 5.00 |
| Withdrawal fee, charged each student who preregisters and withdraws prior to the regular registration. | 2.00 |
| Service fee, charged each student for late payment of tuition. | 5.00 |
| Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees. | 25.00 |
| Residence fee,‡ charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements | 2.00 |
| For special physical examination. | 1.50 |
| Engineers' Council fee, charged each student in the School of Engineering for each semester or any part thereof except the summer term. | 5.00 |
| For each examination to qualify for advanced standing and for each special examination | 3.00 |
| Laboratory checkout fee, charged each student in chemistry courses who fails to check out of the laboratory by the time set by the instructor. | 1.00 |
| Transcript fee, charged for each transcript of record after the first. | |

Additional Course Fees

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in three payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees

* Payable at the time of application for transfer or readmission.
 † When a limited schedule is carried which extends the time of completion of the program of study to more than one year, a proportionate part of the charge may be fixed by the Treasurer.
 ‡ Candidates for the Master's degrees who have paid in full the fee for work leading to and including the Comprehensive Examination but whose Comprehensive Examinations have not been completed will be granted one semester without payment of residence fee.

are paid. Fees for each semester are due and payable in advance at the time of registration.

With the approval of the Treasurer, the student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day* in November; one-third on the first working day* in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day* in March; one-third on the first working day* in April.

A student who fails to meet payments when due, but who pays his fees within the following two weeks of the date on which payment is due, is charged a service fee of \$2. A student who fails to meet payments within these two weeks after payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of \$5.

A student suspended for failure to meet payments when due may not be reinstated for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

Application for withdrawal from the University or for change in class schedule must be made in person or in writing to the Dean. Notification to an instructor is not an acceptable notice.

For regulations governing students in the School of Engineering concerning withdrawal without academic penalty, see page 27.

A student may not withdraw from either the basic course (2 years) or the advanced course (2 years) of the Air Force ROTC without the approval of the President of the University.

In authorized withdrawals and changes in schedules, financial adjustments will be made as follows:

Fall Semester.—Withdrawal dated on or before the last working day* in October, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in November, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in November.

Spring Semester.—Withdrawal dated on or before the last working day* in February, cancellation of two-thirds of tuition charges; withdrawal dated on or before the last working day* in March, cancellation of one-third of tuition charges. No refund or reduction will be allowed on a withdrawal dated subsequent to the last working day* in March.

In no case will a refund be made of the first third of the total tuition charges unless the registration is in advance and is cancelled before the regular registration day. In this case a withdrawal fee of \$5 is charged and tuition fees refunded. In no case will tuition be reduced or refunded because of nonattendance upon classes.

* The University work week is Monday through Friday, inclusive.

Payment applies only to the semester for which a registration charge is incurred and in no case will this payment be credited to another semester.

Any student in chemistry who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a checkout fee in the amount of \$3. A student who drops a course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Any student enrolled in the Air Force ROTC who fails to turn in uniforms, equipment, and textbooks on separation from the Corps will be charged the value of the missing items.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

SCHOLARSHIPS, PRIZES, FINANCIAL AID

SCHOLARSHIPS AND PRIZES

The following scholarships and prizes are limited to students in the School of Engineering. The University offers many others which are open to engineering students. A special bulletin containing a complete list and full information may be obtained from the Chairman of the Committee on Scholarships, The George Washington University, Washington 6, D. C.

Association of Federal Communications Consulting Engineers Scholarship.—This scholarship, which includes tuition, laboratory fees, and books, established in 1958 by the Association of Federal Communications Consulting Engineers (AFCCE), is available to a student of good character, promise, and leadership pursuing a course of study leading to a Bachelor of Electrical Engineering degree and intending to major in communications.

Frederick Albert and Alma Hand Britten Scholarships.—These scholarships, established in 1959 by bequest of Alma Hand Britten, in amounts to be specified from time to time by the Trustees, are available to needy full-time graduate or undergraduate students registered in the School of Engineering, who would not otherwise be able to pursue such professional study. Married students are eligible. Application should be made before March 1 for the following academic year. Application forms are available in the Office of the Dean.

Henry Harding Carter Scholarship.—This scholarship, in the amount of \$500, established in 1896 by Mrs. Maria M. Carter in memory of her husband, Henry Harding Carter, is available to a deserving student who is preparing for the civil engineering profession.

School of Engineering Scholarships.—Four scholarships are available each year in the School of Engineering to graduates of accredited secondary schools. The holders of these scholarships must carry a full program in the School of Engineering.

Each scholarship is a full-tuition scholarship but does not cover special fees. Each scholarship is for four academic years (summer work is not to be included), provided the holder thereof meets all academic and other standards of the University.

To retain a School of Engineering scholarship, an average of B and a satisfac-

tory standard of deportment must be maintained. In case a student marries after the award is made, the scholarship is forfeited. If, for any reason, a holder of a School of Engineering scholarship resigns or is dropped from said scholarship, the scholarship remains unfilled. Application should be made before March 1 for the following academic year. Application forms are available in the Office of the Dean.

Henry Parsons Erwin Scholarship.—This scholarship, in the amount of \$300, established in 1955 by Mrs. Helen B. Erwin as a memorial to her husband, Henry Parsons Erwin, a former Trustee of the University, is available for a student in Engineering.

Texaco Scholarship.—This scholarship, established in 1956 by the Texas Company, covers tuition, fees, and textbooks, and is awarded annually to a young man entering the freshman class in a curriculum which will prepare him for a career in the petroleum industry. It is renewable for the four years of undergraduate work provided the student maintains high standards of scholarship and deportment.

Martin Mahler Prize in Materials Testing.—This prize established in 1953 by Martin Mahler consists of a one-year membership in the American Society for Testing Materials and is awarded to the upper division or graduate student in engineering who submits the best reports on tests in the Materials Laboratories course with preference given to prestressed concrete tests.

School of Engineering Distinguished Scholar.—The Faculty of the School of Engineering awards a certificate to the senior who graduates with the highest scholastic standing. In addition, the student's name is engraved on a plaque displayed in Tompkins Hall. One award is made each year.

Sigma Tau Prize.—Xi Chapter of Sigma Tau Fraternity offers annually a medal to be awarded to that member of the freshman class in the School of Engineering who maintains the highest scholastic standing in the work of the entire year.

Theta Tau Activities Plaque.—Gamma Beta Chapter of Theta Tau Fraternity offers annually the Deacon Ames Activities Award in the form of a plaque awarded to that member of the senior class who has the most outstanding record in activities in the School of Engineering during the entire period of his attendance.

FINANCIAL AID

The following loan funds are available to students in the University in accordance with the qualifications placed thereon by the donors. Inquiries should be directed to the Office of the Treasurer.

University Loan Fund.—The Trustees of The George Washington University have made available a fund for short-term loans to students.

National Defense Student Loan Fund.—This fund is available to full time undergraduate and graduate students who are in need of financial assistance. Priority is given those applicants who express a desire to teach in elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language. After application for admission to the University has been completed, application on forms prescribed for this loan fund must be filed in the Office of the Treasurer no later than August first for the fall semester, December first for the spring semester, and May first for the Summer Sessions.

For information concerning full- and part-time employment, see "The Placement Office", page 12.

REGULATIONS

A student who withdraws or is suspended, or is otherwise absent from the University for one semester or more, may re-enter and continue his work only under the rules and regulations in force at the time of his return.

If a student knowingly makes a false statement or conceals material information on an application for admission, registration card, or any other University document, his registration may be canceled and he will be ineligible (except by special action of the Faculty) for subsequent registration in any unit of the University.

ATTENDANCE

A student may not attend classes until registration is completed and fees due are paid. A student may be dropped from any course for undue absence.

A student suspended for any reason may not attend classes during the period of suspension.

The student is expected to attend every meeting of the course in which he is registered, fully prepared to carry on the work required. The student is held responsible for all work in the course, and all absences must be excused before provision will be made for him to make up the work missed. Excuses for absences from examinations which have been announced in advance can be obtained only by making written application to the instructor in charge of the course.

AMOUNT OF WORK

A full-time undergraduate student who is not on probation may take no more than 20 semester hours. A student employed more than 24 hours a week who is not on probation may take no more than 10 semester hours.

A student previously unemployed who accepts employment after registration must immediately report that fact to the Dean so that his schedule may be adjusted if necessary.

ADVISORY SYSTEM

The School of Engineering encourages a close Faculty-student relationship. Every entering undergraduate student is assigned a permanent Faculty adviser to assist him to orient himself in the engineering discipline. Faculty advisers counsel students on their programs of study, the achievement and maintenance of satisfactory scholastic performance, professional development, and extracurricular activity as part of the educational process. The adviser represents the student in all cases requiring Faculty action.

Students who have not satisfactorily completed 70 semester hours must obtain their advisers' approval of programs of study prior to registration.

Until a student has completed the work of the freshman and sophomore years he must follow the recommendations of his adviser in all academic matters. However, an adviser may not deny a student entry into any course or activity to which he is entitled under the regulations of the School. Students having junior or senior status are encouraged to consult their advisers. The Dean acts as temporary adviser to entering or transfer students pending assignment of their permanent advisers.

All students are encouraged to discuss college problems with their advisers or instructors at any time; and parents or guardians are invited to consult with the Dean and advisers, concerning any student problems.

Faculty advisers discharge their counseling duties in accordance with the high principles of their professional responsibility; however, the final responsibility for a student's action lies wholly with the student.

SCHOLARSHIP REQUIREMENTS

A student must maintain a quality-point index of at least 2.00 to be in good academic standing.

A student who fails to maintain the scholarship requirements of the School of Engineering may be suspended from the University.

GRADES

Grades are not given out by instructors but are mailed to the student through the Office of the Registrar at the close of each semester. Upon request, a copy of the student's grades will be forwarded to his parent or guardian.

The following undergraduate grading system is used: excellent, *A*; good, *B*; average, *C*; passing, *D*; failing, *F*. Whenever a grade has not been assigned, the symbol *I* (incomplete) or the symbol *W* (authorized withdrawal) will be recorded. The symbol *I* indicates that a satisfactory explanation has been given to the instructor for the student's failure to complete the required work of the course. An "incomplete" can not be made up after the lapse of one calendar year except by permission of the Faculty. Courses from which a student has withdrawn by proper authorization will be indicated by the symbol *W*. No student may repeat for grade a course in which he has received a grade of *D* or above, unless required to do so by the department concerned. A written statement to this effect must be submitted to the Registrar by the appropriate departmental executive officer.

For graduate work, grades are indicated as *E* (excellent), *S* (satisfactory), *U* (unsatisfactory). The grade *S* signifies a high level of scholastic achievement.

QUALITY-POINT INDEX

Quality points are computed from grades as follows: *A*, four points; *B*, three points; *C*, two points; *D*, one point; *F*, no points, for each semester hour for which the student has registered.

Scholarship is computed in terms of the quality-point index, obtained by dividing the number of quality points by the number of semester hours for which the student has registered, both based on the complete collegiate record. Courses marked *W* or *I* are not considered in determining the index, except that courses marked *I* will be considered when a formal grade is recorded, or at the close of a calendar year, whichever occurs first. If an "incomplete" is not replaced by a proper grade within the allotted time, it is computed as zero quality points.

Grades in courses taken at another institution or taken to satisfy entrance requirements are not included in the quality-point index.

SCHOLARSHIP*

Undergraduate

In order to graduate, a student must have a quality-point index of at least 2.00 in all work taken at this University and accepted in the School of Engineering.

* For graduate scholarship requirements, see page 35.

Mid-semester Warning.—At the end of the seventh week of each semester, instructors report to the Dean the names of students whose scholarship is unsatisfactory. On receipt of a warning notice the student must consult his instructor and his adviser immediately.

The adviser may prescribe diagnostic tests and/or remedial study to be completed before the end of the current semester.

Probation.—A student whose quality-point index falls below 2.00 is placed on probation. This probation extends over the period in which the student attempts 12 semester hours of study.

A student on probation may be required to follow a program of study, including remedial studies, prescribed by the Committee on Scholarship. He may not hold office, participate in the activities of any student organization, or represent the School in any student activity.

Suspension.—A student whose quality-point index is below 2.00 at the end of his probationary period is suspended. A student whose index falls below 2.00 after removal from probation is suspended.

At the time of his suspension a student may apply to the Committee on Scholarship for guidance concerning remedial action he should take during the period of his suspension.

A student suspended for poor scholarship may apply* to be readmitted in the semester or summer session which begins next after an interval of one calendar year. To be considered for readmission he must pass prescribed tests. A student readmitted after suspension is on probation. He must maintain a current quality-point index of at least 2.50 on each 12 semester hours of work undertaken until his cumulative index is 2.00. In no case will the probationary period after readmission exceed 24 hours of study. A student suspended twice for poor scholarship will not be readmitted.

ACADEMIC DISHONESTY

Evidence of dishonesty on the part of any student will result in his suspension on recommendation of the Dean's Council.

A student found guilty of dishonesty is deprived of credit for *all* courses in the semester during which the dishonest act occurs.

A student may apply to be readmitted in the semester or summer session which begins next after an interval of one year from the date of suspension.

CHANGES IN PROGRAM OF STUDIES

After the registration period a student may not make any changes in his registration without the approval of the Dean. Requests for changes in registration must be made on forms provided in the Office of the School of Engineering.

Transfer from one college, school, or division to another may be made only with the approval of the deans concerned. Application for such change must be made on the proper form, obtainable in the Office of the Director of Admissions, where it should be filed.

During the seven days following the first day of classes of a semester, additional courses may be added to the student's program with the approval of the instructor, the student's adviser, and the Dean.

* Application for readmission should be made two months in advance to permit the taking and grading of readmission tests.

Withdrawal from a course or from the University, *without academic or financial penalty*, requires the permission of the Dean. Permission to withdraw from the University will not be granted a student who does not have a clear financial record.

Withdrawal from any course without academic penalty after the fourteenth day following the first day of classes of a semester may be granted by the Dean under the following conditions: (1) exceptional circumstances make the request necessary; (2) the request is submitted on the official form for late withdrawals; (3) as of the date of request, the grades in all courses involved are C or better; and (4) approval of the Committee on Scholarship is obtained by the student.

In the exceptional circumstances mentioned above the Dean, upon recommendation of the Committee on Scholarship, may authorize withdrawal without academic penalty. In all cases financial regulations governing withdrawals remain in full effect. (See pages 21-22).

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance. (For regulations concerning the refund of fees on withdrawal from courses or from the University, see pages 21-22.)

HONORS LIST

The Faculty of the School of Engineering recognizes meritorious scholastic achievement by an Honors List, containing in alphabetical order the names of candidates for undergraduate degrees in engineering, whose scholastic achievement satisfies all of the following requirements:

1. The candidate's cumulative quality-point index is equal to or exceeds 3.00.
2. At least 30 semester hours of credit have been earned while a degree candidate in the School of Engineering.
3. At least 15 (part-time student) or 30 (full-time student) semester hours of credit in an engineering degree curriculum have been earned in the two semesters immediately preceding the award.
4. No grade below C has been received during the qualifying period stated above.
5. No disciplinary action has been taken in respect to the student.

The Honors List is prepared at the end of the fall and spring semesters and displayed in an appropriate public place in the School of Engineering. A notation is made on the student's record each time his name is included in an Honors List.

CREDIT

Credit toward a degree is given only after registration for and satisfactory completion of the required work of classes or upon the granting of advanced standing in accordance with the regulations of the School. A student who takes a course as an auditor may not take the same course later for credit.

On request the Registrar will issue to the student a balance sheet showing the amount of work completed and the requirements, both quantitative and qualitative, remaining to be met for the degree.

TRANSCRIPTS OF RECORD

Official transcripts of student records will be forwarded on request to other institutions. Unofficial copies of records will be issued to the student on request. No charge is made for the first transcript; a fee of one dollar is charged for each

one thereafter. No certificate of work done will be issued for a student who does not have a clear financial record.

SUMMER SCHOOL CREDIT

A student who plans to attend summer school sessions at another institution and transfer credits so earned toward graduation from this University must first secure the written approval of the Dean. Transferred credits will not be recognized in excess of those which might be earned in a similar period in this institution.

USE OF CORRECT ENGLISH

Any student whose written or spoken English in any course is unsatisfactory may be reported by the instructor to the Dean's Council. The Council may assign supplementary work, without academic credit, varying in amount with the needs of the student. If the work prescribed is equivalent to a course, the regular tuition fee is charged. The granting of a degree may be delayed for failure to make up any such deficiency in English to the satisfaction of the Dean's Council.

GRADUATION REQUIREMENTS

To be recommended by the Faculty for graduation a student must have met the admission requirement of the School, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

Application for Graduation.—Application for a degree must be filed in the Office of the Registrar at the time of registration for the last semester of the senior or final year.

Curriculum.—Curriculum requirements for the Bachelor's degrees are stated on pages 31-34; for the Master's degrees, on pages 36 and 37-38.

Graduate Record Examination.—All candidates for Bachelor's degrees must take two parts of the Graduate Record Examination in the University's institutional testing program. The examinations are conducted by the University twice a year: the Fall Testing Session (December 9, 1961), for seniors graduating in February, and the spring Session (April 7, 1962), for those graduating in June or October. Dates of the examinations are announced in the *Schedule of Classes*.

Each senior required to take the Graduate Record Examination must register for it in the Office of the Dean when he registers for his final regular semester of study (excluding summer sessions). A \$10 examination fee is payable at the time of registration.

Students receive individual reports of test scores and may avail themselves of the transcript services of the Educational Testing Service. By special permission seniors who expect to graduate in June may take the Graduate Record Examination at the previous Fall Testing Session, so as to have transcripts available early in the year when applying for admission to graduate schools.

Residence.—For the Bachelor's degrees, a minimum of 30 weeks and 36 semester hours must be completed in residence. Summer work may be counted. Unless special permission is granted by the Dean to study elsewhere, the work of the senior or final year must be completed in residence.

The graduate student must meet the residence requirements for the degree for which he is registered.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return unless during his absence he maintains "in residence" status by paying the appropriate fee, see page 20. For the purpose of this regulation the summer term will be disregarded, unless the degree is to be conferred at the Fall Convocation.

The student who has completed his tuition requirements, but whose graduation is deferred for any reason, must maintain "in residence" status by paying the residence fee for the semester or summer session immediately preceding the graduation at which he expects to receive his degree.

If a candidate for the degree of Doctor of Science fails to maintain his residence during a period of absence, he must reapply for admission to study under whatever new conditions and regulations are set up by his consultative committee.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Thesis or Dissertation.—A thesis or dissertation submitted in partial satisfaction of requirements for a Master's or Doctor's degree, respectively, must be presented in its final form to the Dean no later than the date specified in the calendar. Three complete copies are required. It is the responsibility of the candidate for a graduate degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the thesis or dissertation, which are rigidly enforced.

Accepted theses and dissertations with accompanying drawings become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in a thesis or dissertation must be secured from the Dean.

Presence at Graduation.—A candidate is required to be present at the graduation exercises unless written application for graduation *in absentia* is approved by the Dean.

HONORS

With distinction.—A Bachelor's degree may be conferred "with distinction", at the discretion of the Faculty, if a student attains a quality-point index of 3.50 or higher on all work taken at this institution. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

Special honors.—A Bachelor's degree may be conferred with "Special honors", at the discretion of the Faculty, for outstanding achievement in the student's major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.

2. The student must meet such other conditions as may be set at the time his candidacy is approved.

3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.

4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

Military honors.—An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Cadet" if he (1) has completed Air Science 101-2 in the upper third of the students enrolled therein; (2) has a cumulative academic average of

B or better; (3) possesses high moral character and definite aptitude for service in the Air Force; (4) has distinguished himself in leadership in recognized extracurricular activities and while in attendance at an Air Force ROTC Summer Training Unit. A "Distinguished Air Force ROTC Cadet" may wear a "Distinguished Cadet" badge above the right breast pocket of the uniform. He may apply for a regular commission in the United States Air Force, which is given final consideration upon his designation as a "Distinguished Air Force ROTC Graduate".

An Air Force ROTC cadet may be designated a "Distinguished Air Force ROTC Graduate" if he has (1) been a "Distinguished Air Force ROTC Cadet" in good standing during the period between designation and graduation; (2) completed the Air Force ROTC Advanced Course; and (3) completed the requirements for the Bachelor's degree. A "Distinguished Air Force ROTC Graduate" will be presented with a certificate signed by the Commandant, Air Force ROTC, and, if he applied, will be considered for a regular commission in the United States Air Force.

THE LIBRARY

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card, issued upon the payment of fees, must be presented as identification.

The loan period for most books available for home circulation is two weeks, with an additional two-week renewal. A fine of five cents will be charged for each day a book is overdue. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

HOURS

The University Library is open from 9:00 A.M. to 10:00 P.M. each class day (Saturday 9:00 A.M. to 5:00 P.M.), and from 2:00 to 6:00 P.M. on Sunday.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

THE BACHELOR'S DEGREES

The Bachelor's degrees are Bachelor of Civil Engineering, Bachelor of Electrical Engineering, Bachelor of Mechanical Engineering, and Bachelor of Science in Engineering.

The degree of Bachelor of Science in Engineering may be earned with any of the following options: Chemistry, Engineering Administration, Machine Computer, Mathematics, or Physics.

Curricula leading to the degrees of Bachelor of Civil Engineering, Bachelor of Electrical Engineering, and Bachelor of Mechanical Engineering are accredited by the Engineers' Council for Professional Development, the recognized accrediting body of the engineering profession.

CURRICULUM REQUIREMENTS

The satisfactory completion of one of the following curricula is required.

Variations from the prescribed curricula may be made, with the permission of the Dean's Council. A student desiring to omit a required course and substitute another must make written application to the Dean presenting satisfactory reasons for the substitution; written approval must be obtained before registration for the course.

A student who is absent from the University for one semester or more is required to satisfy the curriculum requirements existing at the time of his return unless during his absence he maintains "in residence" status, see page 29.

FRESHMAN YEAR (FOR ALL ENGINEERING CURRICULA)*

| | Semester Hours |
|------------------|----------------------------------|
| †Eng. 1-2 | English Composition |
| Math. 12 | Analytic Geometry |
| Math. 29, 30, 31 | Calculus I, II, III..... |
| ME 9 | Introduction to Engineering..... |
| ME 10 | Graphical Communication |
| Phys. 11 | Introductory Physics |
| Phys. 14 | General Physics |
| | Total..... |

ROTC.—Air Force ROTC students take Air Science 1-2 and 22 (4).

SOPHOMORE YEAR (FOR ALL ENGINEERING CURRICULA)

| | Semester Hours |
|----------------|---|
| Chem. 11-12 | General Chemistry |
| CE 21 | Rigid Body Mechanics I..... |
| CE 24 | Strength of Materials..... |
| EE 11-12 | Fundamentals of Electrical Engineering..... |
| Math. 111, 112 | Mathematics for Engineers and Physicists I, II..... |
| Phys. 15, 16 | General Physics |
| ‡Elective | In humanities or social studies (see page 52)..... |
| | Total..... |

ROTC.—Air Force ROTC students substitute Air Science 11-12 and 51 (4) for Elective (3).

* Exceptional students may qualify for admission to advanced courses by successfully completing qualifying examinations.

† Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both semesters of the English Composition course; those who are inadequately prepared for English 1 are assigned to English 1X.

‡ B.E.E. candidates may elect Speech 1, English 11, or Psychology 1.

BACHELOR OF CIVIL ENGINEERING

JUNIOR YEAR

| | | Semester Hours |
|------------|---|-------------------|
| CE 112 | Surveying | 3 |
| CE 121 | Rigid Body Mechanics II..... | 3 |
| CE 125 | Engineering Materials | 4 |
| CE 132 | Fluid Mechanics | 3 |
| CE 143-44 | Structural Theory I-II..... | 8 |
| ME 113 | Thermodynamics I | 3 |
| ME 118 | Heat Transfer | 3 |
| Elective | In humanities or social studies (see page 52) | 10 |
| Total..... | | 37 |

SENIOR YEAR

| | | Semester Hours |
|------------|---|-------------------|
| CE 128 | Soil Mechanics | 3 |
| CE 135 | Hydraulic Engineering | 3 |
| CE 137 | Applied Earth Sciences..... | 3 |
| CE 145 | Metal Structures | 3 |
| CE 146 | Reinforced Concrete | 3 |
| CE 154 | Structural Dynamics | 3 |
| CE 157 | Mechanics of Deformable Bodies | 3 |
| CE 165 | Engineering Planning and Organization..... | 3 |
| CE 168 | Regional and Urban Planning..... | 3 |
| Elective | In humanities or social studies (see page 52) | 6 |
| †Elective | Technical Elective | 6 |
| Total..... | | 39 |

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective in humanities or social studies (6).

BACHELOR OF ELECTRICAL ENGINEERING

JUNIOR YEAR

| | | Semester Hours |
|-------------|---|-------------------|
| CE 121 | Rigid Body Mechanics II..... | 3 |
| CE 132 | Fluid Mechanics | 3 |
| EE 102 | Engineering Electronics | 3 |
| EE 103 | Electric and Magnetic Fields..... | 3 |
| EE 104 | Field Analysis | 3 |
| EE 107 | Steady-state Network Analysis..... | 4 |
| EE 111, 112 | Electrical Measurements | 2 |
| EE 113 | Electric Power Laboratory..... | 2 |
| EE 122 | Measurements and Electronics Laboratory..... | 3 |
| ME 113 | Thermodynamics I | 3 |
| Phys. 116 | Quantum and Solid State Physics..... | 5 |
| Elective | In humanities or social studies (see page 52) | 5 |
| Total..... | | 37 |

SENIOR YEAR

| | | Semester Hours |
|--------|--|-------------------|
| EE 114 | Electric Power Laboratory..... | 2 |
| EE 118 | Electrical Energy Conversion..... | 3 |
| EE 123 | Electronic Devices and Systems Laboratory..... | 2 |

†B.C.E. candidates elect any courses numbered from 101 to 300 in the sciences or engineering offered at this University.

| | | Semester Hours |
|------------|---|-------------------|
| EE 124 | High-frequency Communications Laboratory..... | 2 |
| EE 127 | General Network Analysis and Synthesis..... | 3 |
| EE 133 | Engineering Analysis | 3 |
| EE 136 | Electromagnetic Waves | 3 |
| EE 137 | Electronic Circuits and Systems..... | 3 |
| EE 171 | Digital Circuitry and Systems..... | 3 |
| EE 189 | Undergraduate Thesis in Electrical Engineering..... | 2 |
| ES 154 | Automatic Control | 4 |
| Elective | In humanities or social studies (see page 52)..... | 9 |
| Total..... | | 39 |

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective in humanities or social studies (6).

BACHELOR OF MECHANICAL ENGINEERING

JUNIOR YEAR

| | | Semester Hours |
|-------------|--|-------------------|
| CE 121 | Rigid Body Mechanics II..... | 3 |
| CE 125 | Engineering Materials | 4 |
| CE 132 | Fluid Mechanics | 3 |
| EE 102 | Engineering Electronics | 3 |
| ME 100 | Analytical Kinematics | 3 |
| ME 113, 114 | Thermodynamics I, II..... | 6 |
| ME 118 | Heat Transfer | 3 |
| ME 120 | Physical Metallurgy | 3 |
| Phys. 116 | Quantum and Solid State Physics..... | 3 |
| Phys. 191 | Nuclear Reactors | 3 |
| Elective | In humanities or social studies (see page 52)..... | 5 |
| Total..... | | 39 |

SENIOR YEAR

| | | Semester Hours |
|-------------|--|-------------------|
| CE 157 | Mechanics of Deformable Bodies..... | 3 |
| ME 123, 124 | Advanced Dynamics I, II..... | 6 |
| ME 135-36 | Thermal Power | 6 |
| ME 139 | Fluid Machinery | 3 |
| ME 143 | Production Analysis | 3 |
| ME 146 | Dynamics of Compressible Fluids..... | 3 |
| ES 154 | Automatic Control | 4 |
| Elective | In humanities or social studies (see page 52)..... | 9 |
| Total..... | | 37 |

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective in humanities or social studies (6)

BACHELOR OF SCIENCE IN ENGINEERING

JUNIOR AND SENIOR YEARS

| | | Semester Hours |
|--------|-----------------------------------|-------------------|
| CE 121 | Rigid Body Mechanics II..... | 3 |
| CE 125 | Engineering Materials | 4 |
| CE 132 | Fluid Mechanics | 3 |
| EE 102 | Engineering Electronics | 3 |
| EE 103 | Electric and Magnetic Fields..... | 3 |
| ME 100 | Analytical Kinematics | 3 |

| | | Semester Hours |
|-----------|---|-------------------|
| ME 113 | Thermodynamics I | 3 |
| ME 118 | Heat Transfer | 3 |
| ME 120 | Physical Metallurgy | 3 |
| Phys. 116 | Quantum and Solid State Physics..... | 3 |
| | Total of Required courses..... | 31 |
| Option | As approved by the Department of Option and by the Dean | 30 |
| Elective | In humanities or social studies (see page 52) | 15 |
| | Total..... | 76 |

ROTC.—Air Force ROTC students must elect Geography 146 (3) and Political Science 171 (3) for elective (3) and option course (3).

The Bachelor of Science in Engineering curriculum provides training in the basic physical principles employed in engineering and in engineering methods of analysis, and in addition, offers an opportunity for study in an optional field in which the student has special interest.

Optional studies can be selected from one or (occasionally) more of the fields of Chemistry, Engineering Administration, Machine Computer, Mathematics, or Physics. The program of study in the option is formulated by the department concerned in conference with the student. The program, bearing the approval of the Executive Officer of the department concerned, must be submitted by the student to the Dean before the beginning of the junior year.

THE MASTER'S DEGREES

Upon satisfactory completion of appropriate graduate requirements, the degree of Master of Science in Engineering or Master of Engineering Administration is conferred.

Study for the Master's degree is based upon a faculty-student relationship in which the ability and needs of the individual student are important elements in determining the curriculum. Programs are not restricted to one department or to a single field or type of study. They may include special instruction by assigned members of the engineering faculty or approved courses offered in other colleges and schools of the University. The Committee on Graduate Studies is responsible for establishing each student's program and for providing for its direction.

ADMISSION TO GRADUATE STUDY

For admission to graduate study the student must have a Bachelor's degree from a recognized institution and he must satisfy the Committee on Graduate Studies of his capacity for productive work in the field selected.

Applicants who have significant deficiencies in their preparation may qualify for admission to graduate study by taking prescribed undergraduate courses.

In some cases such study may be carried on in addition to a limited graduate program. In no case may the undergraduate courses fulfill any part of the requirements for the graduate degree.

ADMISSION TO DEGREE CANDIDACY

Application for admission to candidacy for a Master's degree must be made in writing to the Committee on Graduate Studies. To be accepted the applicant must have (1) been accepted for graduate study, (2) satisfactorily completed 9 semes-

ter hours of graduate courses, and (3) give evidence of satisfactory personal and intellectual qualifications. In exceptional cases the requirement of 9 semester hours of graduate courses may be reduced.

ADVANCED STANDING

Graduate courses completed before admission are not transferable for degree credit. The Committee on Graduate Studies may, however, consider them in planning individual programs. Course work to satisfy degree requirements in another school or college of the University may not be so applied in the School of Engineering.

REQUIREMENTS FOR THE DEGREES

Residence

The candidate for a Master's degree must complete a minimum of one year of full-time study, or the equivalent in part-time study, under the direction of the Committee on Graduate Studies. A full-time student must complete all requirements for the degree within three years; a part-time student, within five years.

Scholarship

A minimum grade of "Satisfactory" is required in all courses. A student who makes one grade of "Unsatisfactory" may repeat the course once, or he may appeal to the Committee on Graduate Studies for guidance. A student who receives two or more grades of "Unsatisfactory" will not be permitted to enroll further in the School of Engineering until he demonstrates by examination, or as the Committee may direct, that his deficiencies in course work have been removed. A grade of *B* or better is required for undergraduate courses taken to remove deficiencies in preparation for graduate study.

Master's Thesis

The degree candidate must submit an acceptable thesis to demonstrate his ability to make independent use of the knowledge and discipline of thought acquired and developed by graduate study, and to furnish objective evidence of constructive power in a given field. Work of a suitable character for which the student has professional responsibility may be considered, whether done on or off campus, provided no significant amount of work is completed without faculty supervision.

Comprehensive Examination

To demonstrate substantial understanding of principles and methods of their use in the area of his interest, the student must pass a comprehensive examination, written, oral, or both, as prescribed by the Committee on Graduate Studies. This examination will not be taken until the candidate has successfully completed the prescribed program of study and submitted an acceptable Master's thesis.

THE DEGREE OF MASTER OF SCIENCE IN ENGINEERING

The objective of this discipline is a substantial comprehension of scientific principles and methods for their use, as applied in modern engineering. Increased understanding of engineering science and its use in solving engineering problems are sought, rather than a breadth of familiarity with applications and techniques.

A program of study consisting of at least 24 semester hours of graduate courses to prepare the candidate for his comprehensive examination is formulated from the following areas with particular attention to the individual student's needs and objectives. The program may provide for broad coverage in a variety of fields or may be designed to give some degree of specialization in a particular area, as determined by conference with the Committee at the time of admission to candidacy.

The level of the courses ordinarily requires as prerequisite the satisfactory completion of at least one undergraduate course in mathematics beyond the first course in ordinary differential equations and at least one in the area of the graduate course to be undertaken.

REQUIRED COURSES

Upon admission to graduate study, the following courses must be taken prior to application for admission to candidacy for the degree:

ES 211 Analysis of Engineering Systems I (3)

ES 217 Analytical Mechanics (3)

In addition a choice must be made of one or two courses in the areas marked by an asterisk in the Fundamental Engineering group below.

PROGRAM OF STUDY

After admission to candidacy for the degree, the balance of the program may be arranged in consultation with the Committee on Graduate Studies from the following:

Basic

Mathematics.—Theory of functions of a complex variable, mathematical statistics, mathematical probability, vectors, tensors, matrices.

Physics.—Classical field theory, quantum mechanics, solid state physics, nuclear physics.

Applied Mathematics.—Numerical and graphical analysis, advanced mathematics for engineers.

Fundamental Engineering

*Automatic Control
*Elasticity
Elastic Stability
*Electric Networks
*Electromagnetic Fields
Electronics
*Fluid Dynamics
Gas Dynamics

Heat Transfer
Modulation and Noise
Nonlinear Mechanics
Plates and Shells
Plasticity
*Structural Theory
*Thermodynamics
*Transients

Elective

This group consists of courses offered occasionally in such areas as digital computers, high-speed aerodynamics, jet propulsion, potential theory, structural analysis, and transistors. In addition, graduate courses in areas not included in the Basic group offered by the departments of Mathematics, Statistics, Physics, and Chemistry may be taken for degree credit with the approval of the Committee. In general, work in areas which are characterized by a scientific discipline may be accepted in satisfaction of course requirements for the degree of Master of Science in Engineering.

THE DEGREE OF MASTER OF ENGINEERING ADMINISTRATION

The objective of this discipline is to develop an understanding of the principles and a competence in the practices of administration as applied to engineering and scientific activities. Knowledge and understanding are sought rather than mere familiarity with techniques.

A study program is prescribed for each candidate, in accordance with his preparation and objective, by the Committee on Graduate Studies or an assigned adviser. Programs are integrated sequences of courses.

The degree of Master of Engineering Administration is granted upon the successful completion of (1) 30 semester hours of graduate courses, including the written Master's thesis, and (2) the Comprehensive Examination.

PREREQUISITE TO ADMISSION TO GRADUATE STUDY

In addition to the requirements for admission to graduate study stated on page 34, the applicant must have an adequate knowledge of the principles of human relations, the fundamentals of accounting, and the fundamentals of statistics. This requirement can be met by the successful completion of the following undergraduate courses or an approved equivalent: Psychology 145 *Principles of Human Relations*, Accounting 115 *Survey of Accounting*, and Statistics 107 *Statistics for Engineers*.

PROGRAM OF STUDY

The content of the courses immediately following is considered essential knowledge for every candidate for the degree of Master of Engineering Administration. The candidate is required to complete all of the courses except those in which he (1) has successfully completed graduate study or (2) can demonstrate to the Committee on Graduate Studies an acceptable knowledge of the course field. The following Engineering Administration courses must be taken prior to admission to candidacy: 201 *Engineering Administration I*, 202 *Engineering Administration II*, and 271 *Operations Research*.

| | Semester Hours |
|------------|--------------------------------------|
| EA 201 | Engineering Administration I..... 3 |
| EA 202 | Engineering Administration II..... 3 |
| EA 271 | Operations Research 3 |
| EA 299-300 | Master's Thesis 6 |

The following courses provide knowledge in certain special areas which are significant in engineering administration. The candidate is required to select at least two; it is preferable that he elect three.

| | Semester Hours |
|-----------|--|
| EA 206 | Human Relations in Administration..... 3 |
| EA 251 | Management of Research and Development..... 3 |
| EA 252 | Production and Maintenance Management..... 3 |
| Stat. 262 | Managerial Statistics and Quality Control..... 3 |

Elective

Courses are to be elected to provide a total of 30 semester hours for the program.

| | Semester Hours |
|--------|--|
| EA 261 | Economic Analysis in Engineering Planning..... 3 |
| EA 263 | Quantitative Techniques of Engineering Administration..... 3 |
| EA 272 | Problems in Operations Research..... 3 |

| | | Semester Hours |
|---------------|--|-------------------|
| EA 273-74 | Techniques of Operations Research..... | 6 |
| EA 285 | Seminar on Administrative Problems..... | 3 |
| EA 295 | Applied Research in Engineering Administration (arr.) | |
| EA 296 | Research in Engineering Administration (arr.) | |
| Acct. 215 | Survey of Managerial Accounting..... | 3 |
| Acct. 293 | Budget Preparation and Control..... | 3 |
| Bus. Adm. 250 | Contract Administration | 3 |
| Pub. Adm. 213 | Administration in Government..... | 3 |
| Stat. 271-72 | Statistical Information Theory..... | 6 |
| Elective | (To be selected from Engineering or the sciences), as approved by the Committee on Graduate Studies..... | 3-6 |

THE DOCTORAL PROGRAM

INTRODUCTORY

The School of Engineering offers a program of advanced study and research leading to the degree of Doctor of Science. This program is limited to recognized engineering fields in which a scientific discipline exists and for which the University has adequate resources.

The Doctoral discipline is designed to prepare the student for a career of creative scholarship by providing a broad background of knowledge and an understanding of research methods. It requires study of interrelated fields of learning as well as original research in the engineering field of central interest.

The discipline for the degree is divided into two stages. The first—made up of a study of interrelated fields of learning which support the general area of research concentration—culminates in the qualifying examination. The second—composed of research investigation of a particular subject in a special field and the presentation of such research findings in a written dissertation—culminates in the final examination.

Detailed information on the program is provided in a separate publication obtainable on request.

ADMISSION

The applicant must have adequate preparation for advanced study, including a satisfactory Master's degree, or the equivalent, together with acceptable personal qualities and a capacity for creative scholarship. The applicant must have capabilities and interests beyond the ability to assimilate organized materials in formal courses of instruction. Originality of mind combined with balanced judgment and accuracy in observation or experiment are necessary to the successful applicant.

Language Requirements

A reading knowledge is required of two foreign languages important in the student's field of interest. One language examination must be passed before admission to graduate study. The second must be passed before admission to the qualifying examination and within one year of the start of study for the qualifying examination.

Application for Admission

Well in advance of the opening of the semester for which the student seeks admission, he must have a personal interview with the Chairman of the Committee on Graduate Studies or the professor under whom he wishes to study, to discuss the

field of study, the University's facilities for guidance in this field, the applicant's qualifications, and the possibilities of an effective doctoral program. If an application for admission is indicated, the student will be advised concerning the details of application procedure.

STUDY FOR THE QUALIFYING EXAMINATION

Upon admission to study for the qualifying examination the student's admission committee becomes his Consultative Committee, which prescribes and directs his studies. The Committee assigns to him a group of fields of learning deemed necessary to insure his breadth of knowledge, as well as to support research in his central field. Members of the Committee advise the student concerning the scope and content of these fields of study, which are generally more inclusive and intensive than courses of instruction announced in the University catalogue, and will guide him in preparation for his examination in them.

The purpose of the qualifying examination is to ascertain that the student's breadth of background and intellectual development are adequate to support doctoral research and investigation in his central field. The qualifying examination is both written and oral and usually extends over a period of six days. It is given by a special committee consisting of members of the student's Consultative Committee and other scholars. Upon favorable report of the examiners to the Committee on Graduate Studies the student is admitted to candidacy for the degree, to pursue his specialized study and research under the supervision of a designated member of the Faculty.

The examination is the sole test of the student's ability to qualify for admission as a candidate for the degree, and to enter the second stage of his doctoral discipline.

RESEARCH, THE DISSERTATION, AND THE FINAL EXAMINATION

The student admitted to candidacy for the degree requests as Master in Research the member of the Faculty under whom he wishes to pursue research and specialized study. The Faculty member may accept or reject such request. The research is arranged by the Master and approved by the Committee on Graduate Studies. Throughout the remainder of the doctoral program, the candidate is responsible solely to his Master in his research and in the presentation of his dissertation.

A dissertation is required as evidence of ability to perform scholarly research and to interpret and present its results. Upon approval of the dissertation (see page 29) by the Master, the candidate is presented for his final examination. The summaries of accepted dissertations are printed in a numbered issue of the University BULLETIN. The successful candidate is required before receiving his degree to pay a fee to cover the expense of the printing of the summary of his dissertation.

The final examination is oral and is open to the public. The candidate must demonstrate a mastery of his special field of interest and of the materials and techniques used in the research. The committee of examiners includes members of the Committee on Graduate Studies competent in the research field or in closely related subjects and may also include qualified experts brought to the University especially to participate in the examination. If the candidate satisfies the examining committee concerning the high quality and originality of his contribution to knowledge as well as his mastery of the scholarship and research techniques of his

field, the Committee on Graduate Studies recommends him for the degree of Doctor of Science.

RESIDENCE AND CONTINUOUS STUDY

All of the work for the degree must be done in residence (on the campus), except in certain circumstances when the student may be permitted to undertake a portion of the research problem in an approved off-campus facility. The student must maintain continuous registration in the School of Engineering, even when the Committee on Graduate Studies has granted a leave of absence. Failure to maintain registration in each semester of the academic year disrupts the residence status of the student, and he must apply for readmission to graduate study under whatever new conditions and regulation are set up by his consultative committee.

There is no formal regulation concerning the minimum amount of time to be spent in preparation for the qualifying examination or as a candidate engaged in doctoral research. The qualifying examination, however, must be completed within five years of the date of admission, and the entire degree program must be completed within seven years. After admission the student may apply for his qualifying examination whenever his consultative committee believes that he is prepared to take it; his research and specialized study may be undertaken with whatever concentration of time meets the approval of his research adviser. Normally a minimum of two years of full-time study and research is spent in meeting the requirement for the degree.

COURSES OF INSTRUCTION

On the following pages, under the alphabetically arranged names of the departments of instruction, are listed the courses of instruction offered in the School of Engineering. Also listed are courses offered by other schools and colleges of the University, but required or accepted as electives for the degrees in engineering. The courses as here listed are subject to some slight change. Students are referred to the *Schedule of Classes*, which is available prior to the opening of each semester, for the hourly scheduling of all courses of instruction.

The University reserves the right to withdraw any course announced.

EXPLANATION OF COURSE NUMBERS

The following system of numbering is used to identify courses.

Undergraduate courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. Courses numbered from 101 to 200 are planned for students in the junior and senior years.

Graduate courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the Chairman of the Committee on Graduate Studies and the Dean, to qualified seniors.

INDICATION OF THE AMOUNT OF CREDIT

The number of semester hours given for the satisfactory completion of a course is, in most cases, indicated in parentheses after the name of the course. Thus, a year course giving three hours of credit each semester is marked (3-3), and a semester course giving three hours of credit is marked (3). A semester hour usually consists of the completion of one fifty-minute period of class work or of one laboratory period a week for one semester.

ENGINEERING

UNDERGRADUATE COURSES

CIVIL ENGINEERING

21 *Rigid Body Mechanics I* (3)

Fall—morning and evening; spring—evening. Fundamental laws of Newtonian mechanics; equilibrium of a particle and a system of particles; beams, cables, trusses, and friction; plane kinematics. Prerequisite: Mathematics 31, Physics 14.

24 *Strength of Materials* (3)

Fall—evening; spring—morning and evening. Elementary principles of mechanics of deformable bodies; elastic and inelastic behavior, concept of stress and strain in two and three dimensions, strain energy and its application; analysis of axial loading, pure bending, torsion, combined loading, buckling, stress concentration, and fatigue. Prerequisite: Civil Engineering 21, Mathematics 31.

112 *Surveying* (3)

Spring: lecture (2 hours), field work (2 hours)—Saturday. Plane surveying, including measurements, simple curves, and topographical surveying; space measurements; treatment of observational errors; earthwork computations; field astronomy. Prerequisite: Mathematics 31, Mechanical Engineering 10. Surveying fee, \$13.

121 Rigid Body Mechanics II (3)

Fall—morning and evening; spring—evening. General force systems, equilibrium of a rigid body, generalized coordinates and constraints, work and potential energy, kinetic energy and angular momentum, dynamics of a particle and rigid bodies in space, impulsive motion. Prerequisite: Civil Engineering 21, Mathematics 111.

125 Engineering Materials (4)

Fall: lecture—morning and evening; laboratory—afternoon and evening. Mechanical and surface properties of engineering solids; relationships between the structure of a material and its mechanical and physical behavior; principles of the control of the properties of metals and nonmetallic solids. Prerequisite: Chemistry 12, Civil Engineering 24, Physics 16. Laboratory fee, \$11.

128 Soil Mechanics (3)

1961-62 and alternate years: spring—evening; 1962-63 and alternate years: spring—afternoon. Mechanical properties of soils; theory and applications of lateral earth pressure, bearing capacity, and settlement of foundations. Prerequisite: Civil Engineering 125, 137, 144.

132 Fluid Mechanics (3)

Spring: lecture—morning and evening; laboratory—afternoon and evening. Development of the fundamental principles of flow of viscous and ideal compressible and incompressible fluids; dimensional analysis and model theory; laboratory work emphasizes principles, analysis of tests, and systematic observations of phenomena. Prerequisite: Civil Engineering 121, Mathematics 111, Mechanical Engineering 113. Laboratory fee, \$11.

135 Hydraulic Engineering (3)

1961-62 and alternate years: spring—evening; 1962-63 and alternate years: spring—afternoon. Applied fluid mechanics; pipe and open-channel flow; dams, spillways, and reservoirs; hydroelectric development; drainage and irrigation; control of river flow and floods; water supply and sewerage. Prerequisite: Civil Engineering 137.

137 Applied Earth Sciences (3)

1961-62 and alternate years: fall—evening; 1962-63 and alternate years: fall—afternoon. Structural geology of rock and soil formations, seismology, climatology, ground water and river flow, hydrology, erosion and sedimentation, conservation. Prerequisite: Chemistry 12, Civil Engineering 125, 132.

143-44 Structural Theory I-II (4-4)

1961-62 and alternate years: academic year—evening; 1962-63 and alternate years: academic year—afternoon. Theory and structural behavior of statically determinate and indeterminate beams, frames, trusses, and arches, and the application of basic principles to their analysis; structural laboratory including structural model analysis. Prerequisite or concurrent registration: Civil Engineering 125, Mathematics 111. Laboratory fee, \$11 a semester.

145 Metal Structures (3)

1961-62 and alternate years: spring—afternoon; 1962-63 and alternate years: spring—evening. Application of structural theory to the analysis and design of metal structures under static and moving loads. Prerequisite: Civil Engineering 144, 157.

146 Reinforced Concrete (3)

1961-62 and alternate years: fall—afternoon; 1962-63 and alternate years: fall—evening. Theory and design of plain and reinforced concrete structures. Prerequisite: Civil Engineering 144. Prerequisite or concurrent registration: Civil Engineering 157.

154 Structural Dynamics (3)

1961-62 and alternate years: spring—late afternoon; 1962-63 and alternate years: spring—afternoon. Single degree of freedom systems, energy methods of finding natural frequencies, transient and forced vibration of structures. Prerequisite: Civil Engineering 144, Mathematics 111.

157 Mechanics of Deformable Bodies (3)

1961-62 and alternate years: fall—evening; 1962-63 and alternate years: fall—afternoon. An introduction to the advanced mechanics of deformable bodies including the theories of elasticity in cartesian and polar coordinates, plasticity of perfectly plastic solids, and elastic stability. Prerequisite: Civil Engineering 125, Mathematics 112. Prerequisite or concurrent registration: Civil Engineering 144 or Mechanical Engineering 123.

165 Engineering Planning and Organization (3)

1961-62 and alternate years: fall—afternoon; 1962-63 and alternate years: fall—evening. Planning, organization, administration, and economics of engineering programs and projects, including applications of operations research and electronic computers. Prerequisite: senior standing.

168 Regional and Urban Planning (3)

1961-62 and alternate years: spring—afternoon; 1962-63 and alternate years: spring—evening. Regional and urban planning including engineering aspects in connection with transportation, water supply and sewerage, and public safety and convenience. Prerequisite: Civil Engineering 165.

195-96 Problems in Civil Engineering (arr.)

Academic year—as arranged. Special problems approved by the Staff. Prerequisite: senior standing.

ELECTRICAL ENGINEERING**11-12 Fundamentals of Electrical Engineering (3-3)**

Fall—morning and evening; spring—morning and evening. Electric and magnetic fields, d-c and a-c electrical circuits and networks, energy sources, electromechanical energy conversion, power, electronic devices, and circuits. *First half*: fields and circuits. *Second half*: energy, power, and electronics. Prerequisite to Electrical Engineering 11: Physics 15 and Mathematics 111 or concurrent registration. Prerequisite to Electrical Engineering 12: Electrical Engineering 11.

102 Engineering Electronics (3)

Spring—morning and evening. Vacuum tube and solid state devices as circuit elements, equivalent circuits, voltage and power amplifiers, feedback amplifiers, oscillators, relaxation circuits. Emphasis placed on design of electronic circuits. Prerequisite: Electrical Engineering 12, Mathematics 112.

103 Electric and Magnetic Fields (3)

Fall—morning and evening. Introduction to vector analysis and its application to static electric and magnetic fields; method of images, solid angle, particle motion in electric and magnetic fields. Prerequisite: Electrical Engineering 12, Mathematics 112.

104 Field Analysis (3)

Spring—morning and evening. Vector potential, magnetic scalar potential, conformal mapping, solutions of Laplace's equation, field plotting, analogues. Introduction to Maxwell's equations and electromagnetic waves. Prerequisite: Electrical Engineering 103, Mathematics 112.

107 Steady-state Network Analysis (3)

Fall—morning and evening. Four-terminal networks, network theorems, poles and zeros of network functions, resonance, filters, coupled circuits, transmission lines, Fourier series, matrices. Prerequisite: Electrical Engineering 11, Mathematics 112.

111 Electrical Measurements (2)

Fall—morning and evening. Systems of units; theory of errors; d-c indicating instruments and galvanometer dynamics; precision measurement of voltage, current, and resistance. Prerequisite: Electrical Engineering 11, Mathematics 112.

112 Electrical Measurements (2)

Spring—morning and evening. Theory of a-c indicating instruments, a-c bridges, waveforms, frequency measurements, measurement of power and energy. Prerequisite: Electrical Engineering 107, 111.

113-14 Electric Power Laboratory (2-2)

Academic year—afternoon and evening. Experiments in d-c and a-c circuits, instruments, and machines. Prerequisite to Electrical Engineering 113; Electrical Engineering 12. Prerequisite to Electrical Engineering 114; Electrical Engineering 113. Laboratory fee, \$11 a semester.

118 Electrical Energy Conversion (3)

Spring—morning and evening. Analysis of physical systems involving electrical, mechanical, and thermal energy conversion; mathematical formulations using the Euler-Lagrange equation; transient and steady-state analysis of special machines including the generalized rotating energy converter. Prerequisite: Electrical Engineering 12, Mathematics 112. Prerequisite or concurrent registration: Electrical Engineering 104, 112.

122 Measurements and Electronics Laboratory (2)

Spring—afternoon and evening. Experiments with sources, meters, bridges, and simple electronic devices; network theorems and resonance; use of instruments and oscilloscope; measurement of resistance, capacitance, inductance. Prerequisite or concurrent registration: Electrical Engineering 102, 112. Laboratory fee, \$11.

123 Electronic Devices and Systems Laboratory (2)

Fall—afternoon and evening. Theory and use of electronic devices and instruments. Experiments in active networks, tubes and transistors, nonlinear elements, complex waveform analysis, transfer characteristics. Prerequisite: Electrical Engineering 122. Prerequisite or concurrent registration: Electrical Engineering 137. Laboratory fee, \$11.

124 High-frequency Communications Laboratory (2)

Spring—afternoon and evening. Experiments at radio- and microwave-frequencies: impedance, amplifiers, transmitters, lines, waveguides, slotted lines, antennas, horns, power, oscillators. Prerequisite: Electrical Engineering 123. Prerequisite or concurrent registration: Electrical Engineering 136. Laboratory fee, \$11.

125-26 Project Laboratory (2-2)

Academic year—as arranged. Creative projects and experiments with electrical and electromechanical devices and systems carried out under individual supervision. May be substituted for required courses. Prerequisite: Electrical Engineering 122, senior status, and permission of instructor. Laboratory fee, \$11 a semester.

127 General Network Analysis and Synthesis (3)

Fall—morning and evening. Solutions of linear integro-differential equations using transformation calculus. Laplace transforms, Fourier integral, poles and zeros of network functions, correlation of time and frequency domains, elements of network synthesis. Prerequisite: Electrical Engineering 107, Mathematics 112.

133 Engineering Analysis (3)

Fall—morning. Application of fundamental principles of engineering, physics, and mathematics to problems in various fields of engineering. Emphasis is placed on problem solving using concepts previously studied. Prerequisite: Civil Engineering 121, Electrical Engineering 102, Mathematics 112, Physics 16.

136 Electromagnetic Waves (3)

Spring—morning and evening. Electromagnetic waves in bounded media, radiation from antennas, high-frequency transmission lines, cavity resonators, and microwave devices. Prerequisite: Electrical Engineering 104, Mathematics 112.

137 Electronic Circuits and Systems (3)

Fall—morning and evening. Analysis of two-port networks; matrix representation of linear active networks; vacuum-tube and semiconductor circuit theory; concepts of feedback, stability, and oscillators. Nonlinear circuit analysis, modulation, detection, communication systems. Prerequisite: Electrical Engineering 102 or Physics 132, Electrical Engineering 107, Mathematics 112.

171 Digital Circuitry and Systems (3)

Fall—late afternoon. Introduction to basic concepts of modern digital programmed systems, mathematical foundations and techniques for logical design of digital circuits,

electronic design of computer circuits. Prerequisite: Mathematics 111, Electrical Engineering 102 or Physics 132.

172 Digital Techniques (3)

Spring—late afternoon. Continuation of Electrical Engineering 171. Automatic programming techniques, self-detecting and correcting codes, advanced logical circuit design, electronic design of digital transistor and magnetic core circuits, memory systems, analog-to-digital techniques, wiring diagrams. Prerequisite: Electrical Engineering 171.

174 Digital and Analog Computer Laboratory (2)

Spring—afternoon. Theory and use of digital and analog computers: programming, operating, logical circuitry, design, troubleshooting. Prerequisite: Electrical Engineering 137, 171. Laboratory fee, \$11.

189 Undergraduate Thesis in Electrical Engineering (2)

Academic year—afternoon and evening. Individual research projects in electrical engineering.

191 Proseminar in Digital Computers (1)

Fall—late afternoon; spring—late afternoon. Oral and written presentation of technical and nontechnical papers based on current literature and on original studies, with group discussion and critical analysis. Prerequisite: senior status.

MECHANICAL ENGINEERING

9 Introduction to Engineering* (3)

Fall—morning and evening; spring—evening. Number systems, computation aids, scientific method, problem solving techniques, use of mathematical tables. Emphasis is placed on the development of sound reasoning and study methods.

10 Graphical Communication (2)

Fall—evening; spring—morning and evening. Spatial visualization, engineering drawing, schematic diagrams, descriptive geometry. A laboratory course. Laboratory fee, \$10.

100 Analytical Kinematics (3)

1961-62 and alternate years: spring—morning; 1962-63 and alternate years: spring—evening. Theoretical study of the motion of constrained and unconstrained rigid bodies. Prerequisite or concurrent registration: Civil Engineering 121, Mathematics 112.

113 Thermodynamics I (3)

Fall—morning and evening. Theoretical study of fundamental concepts, equations of state, first and second laws of thermodynamics, entropy, single and two-phase mixtures. Prerequisite: Chemistry 12, Mathematics 111, Physics 16.

114 Thermodynamics II (3)

Spring—late afternoon. Theoretical study of vapor cycles, combustion, gas dynamics, equilibrium, multiphase mixtures. Prerequisite: Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132, Mechanical Engineering 113.

118 Heat Transfer (3)

Spring—morning and evening. Heat transfer theory, conduction, convection, radiation, field and potential theory applied to conduction. Prerequisite: Mathematics 112, Mechanical Engineering 113. Prerequisite or concurrent registration: Civil Engineering 132.

120 Physical Metallurgy (3)

1961-62 and alternate years: spring—evening; 1962-63 and alternate years: spring—morning. Physics of metals, crystal and lattice structures, binary and ternary alloys, properties of alloys, nonequilibrium conditions, phase diagrams. Lecture and laboratory. Prerequisite: Civil Engineering 125, Mathematics 31. Laboratory fee, \$10.

* This course should be completed before the beginning of the sophomore year.

123 Advanced Dynamics I (3)

1961-62 and alternate years: fall—morning; 1962-63 and alternate years: fall—evening. Shock and vibrations in linear mechanical systems, electromechanical analogies, transient and steady-state analysis. Prerequisite: Mechanical Engineering 100. Prerequisite or concurrent registration: Civil Engineering 157.

124 Advanced Dynamics II (3)

1961-62 and alternate years: spring—morning; 1962-63 and alternate years: spring—evening. Advanced study of dynamics of continuous mechanical systems. Lagrange's equations, Hamilton's principle, gyrostatics. Prerequisite: Mechanical Engineering 123.

135-36 Thermal Power (3-3)

1961-62 and alternate years: academic year—morning; 1962-63 and alternate years: academic year—evening. Analysis and design principles governing systems and components in heat-power, gas and vapor turbines, internal combustion engines, heat pumps, nuclear power systems. Lecture and laboratory. Prerequisite: Civil Engineering 132; Mechanical Engineering 114, 118; Physics 191. Prerequisite or concurrent registration: Mechanical Engineering 139. Laboratory fee, \$15 a semester.

139 Fluid Machinery (3)

1961-62 and alternate years: fall—morning; 1962-63 and alternate years: fall—evening. Positive-displacement machines; hydraulic circuits and servo-mechanisms; general theory of dynamic machines; velocity diagrams and work transfer; radial, axial, and mixed-flow machines; torque converters and couplings; jet machines. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 113. Prerequisite or concurrent registration: Mechanical Engineering 123. Laboratory fee, \$10.

143 Production Analysis (3)

1961-62 and alternate years: fall—evening; 1962-63 and alternate years: fall—morning. Principles of schematic models, mathematical programming, quality control, operations analysis. Prerequisite: Mathematics 112.

146 Dynamics of Compressible Fluids (3)

1961-62 and alternate years: spring—morning; 1962-63 and alternate years: spring—evening. Mathematical theory of compressible fluid flow, flow around immersed bodies, airfoil theory, shock-wave theory, thermodynamics of compressible fluids. Lecture and laboratory. Prerequisite: Civil Engineering 132, Mechanical Engineering 118. Laboratory fee, \$10.

195-96 Special Topics in Mechanical Engineering (arr.)

Academic year—as arranged. Special problems approved by the Staff. May be substituted for required senior courses. Prerequisite: senior status and approval of the instructor.

GRADUATE COURSES

Prerequisites for graduate courses are not listed explicitly. Instructors in individual courses will state prerequisites, and may recommend preparatory work to be completed prior to admission to the course. (See also page 34.)

ENGINEERING ADMINISTRATION

The School of Engineering offers the following courses primarily for candidates for the degree of Master of Engineering Administration. Other courses listed in this program are offered by the departments of Accounting, Business and Public Administration, Psychology, and Statistics.

191 Engineering Law* (3)

Spring—evening. The influence of contract, property, and tort law upon engineering activities. Legal principles relating to the organization and management of engineering companies and governmental departments; legal procedures of interest to engineers. Topics considered include contracts, agency, partnership, corporations, liens, and expert testimony.

201 Engineering Administration I (3)

Fall—evening; spring—evening. Application of scientific method to the administrative processes of (1) planning and (2) organizing; including development of objectives, key factors in planning, basics of organization, stages of organizational growth, special problems of organization in an engineering or scientific enterprise.

202 Engineering Administration II (3)

Fall—evening; spring—evening. Continuation of Engineering Administration 201. Application of scientific method to the administrative processes of (3) managing or directing and (4) evaluation and control. Study of delegation; decentralization; personnel relations; management development; systems engineering; automation; financial analysis, budgeting, and administrative audits.

206 Human Relations in Administration (3)

Fall—evening; spring—evening. The meaning, principles, and practices of management development and personnel relations; collective bargaining; principles and practices of personnel administration; professional social relations.

251 Management of Research and Development (3)

Fall—evening; spring—evening. Management problems involved in the administration of research and development programs; exploration of techniques in programming; the planning of research and development; selection of organizations for research, maintenance, control, and evaluation of projects.

252 Production and Maintenance Management (3)

Fall—evening; spring—evening. Planning, organizing, and managing of production and systems. Managerial implications of automation. Study of skills and abilities essential to industrial management, including maintenance of equipment and real property.

261 Economic Analysis in Engineering Planning (3)

Fall—evening; spring—evening. Application of economic principles to engineering administration: inputs, outputs, investments, and prices. Studies are made of the methods of analyzing economic factors in evaluating alternate courses of administrative action in government and industry.

263 Quantitative Techniques of Engineering Administration (3)

Spring—evening. Application of the various quantitative techniques, mathematical, statistical, and other management sciences' techniques to the analysis of engineering administration and the solution of administrative problems by the use of models, theories, and measurements.

271 Operations Research (3)

Fall—evening; spring—evening. Background and application of operations research; history, characteristics, capabilities, administrative considerations, cases, methods, and techniques, including construction of conceptual and mathematical models.

272 Problems in Operations Research (3)

Spring—evening. Illustrations of the application of operations research by study of case histories: examples of the formulation and preliminary order-of-magnitude case; examples of broader scope.

273-74 Techniques of Operations Research (3-3)

Academic year—evening. Theory and application of techniques used in operations research, including order-of-magnitude estimation, probability and mathematical statistics, symbolic logic, inequality-constrained stationary-value problems, dynamics of

* An undergraduate course which may be taken for graduate credit with the approval of the Committee on Graduate Studies.

populations, Monte Carlo simulation, strategic gaming, and error and sensitivity analysis.

285 Seminar in Administrative Problems (3)

Academic year—evening. Individual analysis of complex administrative problems, with group evaluation and discussion. Prerequisite: admission to candidacy and completion of at least 18 semester hours of graduate study.

295 Applied Research in Engineering Administration (arr.)

Fall—as arranged; spring—as arranged. Application of established principles to new engineering administrative situations; the development of new knowledge of administration.

296 Research in Engineering Administration (arr.)

Fall—as arranged; spring—as arranged. Creative thinking in engineering administration, initiation of new theories and principles, development of new hypotheses, experimentation, proof of theories and hypotheses.

299-300 Thesis (3-3)

Academic year—as arranged.

ENGINEERING SCIENCE

The following courses serve as foundations for specialization, since they are concerned with a body of knowledge applicable in a variety of engineering fields.

130 Introductory Astronomy (3)

Spring—evening. Coordinate systems and nomenclature used in astronomy, description of astronomical systems from solar system to metagalaxies, introduction to celestial mechanics, types of stars, stellar physics. Prerequisites: integral calculus and one year of college physics.

154 Automatic Control* (4)

Spring—morning and evening. Theory of automatic control systems including electromechanical, pneumatic, and hydraulic systems. Transient analysis, transfer functions, stability criteria. Experimental study of automatic control systems. Lecture and laboratory. Prerequisite: Electrical Engineering 127 or Mechanical Engineering 123. Laboratory fee, \$11.

201 Automatic Control (3)

Fall—evening. Advanced theory of automatic control. Systems analysis, multiple-loop systems, nonlinear systems.

211 Analysis of Engineering Systems I (3)

Fall—afternoon and evening; spring—evening. A course in the mathematical analysis of engineering systems employing such topics as complex variables, infinite series, orthogonal functions, matrices and vector spaces, partial differential equations, probability, and calculus of variations. The required level of preparation is equivalent to Mathematics 111 and 112 as given at this University.

212 Analysis of Engineering Systems II (3)

Fall—evening; spring—evening. Continuation of Engineering Science 211. Mathematical topics include: functions of complex variables, operational and transform methods, numerical solutions of differential equations, finite differences, matrices.

217 Analytical Mechanics (3)

Fall—evening; spring—evening. Fundamental principles, generalized coordinates, variational principles and Lagrange's equations, nonholonomic systems, Hamilton's equations, theory of small oscillations.

218 Mechanics of Orbits and Trajectories (3)

1962-63 and alternate years: fall—evening. Celestial mechanics. Orbits and trajectories in force fields. Dynamics of space vehicles.

* An undergraduate course which may be taken for graduate credit with the approval of the Committee on Graduate Studies.

220 Nonlinear Mechanics (3)

Spring—evening. Topological and analytical methods in nonlinear mechanics, nonlinear resonance, relaxation oscillations.

221 Theory of Elasticity I (3)

Fall—evening. Introduction to mathematical theory of elasticity, analysis of strain and stress, generalized Hooke's law, equilibrium equations, Beltrami-Michell equations, strain energy functions, torsion, general flexure.

222 Theory of Elasticity II (3)

1962-63 and alternate years: spring—evening. First and second boundary-value problems in plane elasticity, uniqueness of solutions, simply and multiply connected regions, three-dimensional problems, thermoelasticity, vibration of elastic solids, variational methods.

223 Celestial Mechanics (3)

Time to be arranged. General equations of motion; Lagrange's planetary equations; disturbing function; Delaunay and Poincaré variables; secular inequalities; lunar theory; precession and nutation.

227 Experimental Stress Analysis (3)

Time to be arranged. Applications of the theory of elasticity in the analysis of strain and stress; theory of gaging for static and dynamic strain and stress measurements.

231 Fluid Dynamics (3)

Fall—evening. Theory of compressible and incompressible fluid motion including potential motion, circulation and vorticity, mathematical treatment of flow at sub-, trans-, and supersonic velocities, normal and oblique shock, and elements of heat transfer.

233 Engineering Problems (3)

Spring—evening. Investigation of problems in engineering science, emphasizing imaginative and systematic application of fundamental principles in engineering, physics, and mathematics.

241 Science of Engineering Materials (3)

1961-62 and alternate years: fall—evening. Relation of the atomic and microscopic structure of engineering materials to their physical and mechanical properties and their mechanical behavior in engineering applications.

251 Magnetohydrodynamics (3)

Time to be arranged. Study of the interaction of electromagnetic and fluid fields. Dynamics of conducting fluids in electromagnetic and magnetic fields.

299-300 Thesis (3-3)

Academic year—as arranged.

CIVIL ENGINEERING**216 Metal Structures (3)**

Time to be arranged. Structural behavior and failure of metal structures; materials; residual stresses; analysis and design of connections and members; theory of plastic collapse of structures; plastic design.

217 Ultimate Strength of Reinforced Concrete Structures (3)

Time to be arranged. Modes of failure of reinforced concrete structures; experimental data on failure; ultimate strength concepts for the analysis of beams, slabs, and columns.

218 Prestressed Concrete Structures (3)

Time to be arranged. Structural behavior and failure of prestressed concrete structures; materials; theory, analysis, and design of prestressed concrete structures and members.

224 Theory of Plates and Shells (3)

1962-63 and alternate years: spring—evening. Classical and modern theories of plates and shells, plates and cylindrical shells under different loadings and boundary conditions, equations for plates including shear, rotationally symmetric shells under small deformations and their applications.

226 Plasticity of Solids (3)

1961-62 and alternate years: fall—evening. Plastic flow and fracture of solids; theory of elastic perfectly plastic solids, including basic concepts, limit analysis of beams, rigid frames, and plane stress problems; theory of fracture.

234 Geotechnics in Soil Mechanics (3)

1962-63 and alternate years: fall—evening. Dynamic geology in the formation and properties of soils; Boussinesq and Westergaard equations for stresses and deformations in soil masses; analysis of settlement; flow of water in soils; solutions of Laplace-type equations for seepage involving foundations, earth dams, and wells; theory of frost action.

235 Theoretical Soil Mechanics (3)

1962-63 and alternate years: spring—evening. Theories of soil strength and conditions for failure, bearing capacity of footings, pile foundations, theories of lateral earth pressure, stability of slopes, soil dynamics.

238 Foundation Engineering (3)

Time to be arranged. Principles of soil mechanics and structural mechanics in the analysis and design of spread footings, mat and pile foundations, retaining walls, sheet piling and water front structures.

251 Theory of Structures I (3)

Fall—evening. Classical and modern methods of structural analysis; basic theory of plane structures; statically indeterminate structures, including continuous beams and trusses and arches; limit-load analysis; special problems.

252 Space Structures (3)

1962-63 and alternate years: spring—evening. Theory of structures in three dimensions: trusses, rigid frames, and thin-shell structures.

253 Theory of Structures II (3)

1961-62 and alternate years: spring—evening. Statically indeterminate structural theory, including single and multi-span rigid frames and arches, deflection theory for arches and suspension bridges, thermal stress, and failure of structures.

254 Theory of Structural Dynamics (3)

1961-62 and alternate years: spring—evening. Analysis of elastic structures under various dynamic loadings, both steady-state and transient, including vibrations of rigid frames, plates, and thin shells.

256 Theory of Elastic Stability (3)

1962-63 and alternate years: fall—evening. Beam-column problems and methods of analysis (including numerical analysis); lateral buckling of beams; buckling of rigid frames, arches, plates, stiffened plates, and shells; inelastic buckling.

272 Experimental Structural Analysis (3)

Time to be arranged. Experimental analysis of truss, rigid frame, plate, and shell structures; large- and small-deflection models; similitude.

275 Concepts of Structural Design (3)

Time to be arranged. Mechanical behavior and failure of structures as determined by properties of materials, nature of structure, and type of loading; selection of type of structure; structural analysis, its applications and possible simplifications.

ELECTRICAL ENGINEERING

203 Operational Analysis of Linear Systems (3)

Fall—evening. Transient analysis of linear, lumped-parameter electrical and mechanical systems by operational methods with emphasis on Laplace transforms.

205 Electronic Circuit Analysis (3)

Spring—evening. Methods of linear and nonlinear analysis applied to passive and active networks including vacuum-tube and transistor circuits, and magnetic and dielectric amplifiers.

207 Steady-state Network Analysis (3)

Spring—evening. Analysis of lumped, linear networks: determinants, loop and node analysis, network theorems, four-terminal networks, filters, complex frequency, network functions, and general network properties.

209 Electromagnetic Field Analysis (3)

Fall—evening. Electrostatics, magnetics, and Maxwell's equations: solutions of Laplace's equation, retarded potentials, electromagnetic waves in bounded media, field analysis techniques.

211 Physical Electronics (3)

Fall—evening. Physical principles underlying operation of various electronic devices including vacuum tubes, electron lenses, transistors, and recent solid-state electronic devices.

215 Analysis of Modulation and Noise (3)

Spring—evening. Analysis by Fourier series and integrals of signals and linear networks, modulation and spectra, noise analysis including probability method of determining power spectra.

231 Basic Concepts of Digital Computers (3)

Spring—evening. The programmed system, logical and system design of digital computers, special-purpose digital computers, theory of switching circuits and computer logic, reliability, digital electronic circuits, modern developments.

MECHANICAL ENGINEERING**211 Thermodynamics (3)**

Fall—evening. Reversible and irreversible processes, equilibrium, ideal and van der Waal's gases, dilute solutions, phase equilibria, electric and magnetic effects, radiation. Introduction to kinetic theory and statistical mechanics.

213 Heat Transfer (3)

Spring—evening. Physical and mathematical concepts of heat transfer phenomena under steady and unsteady conditions, including: Stefan-Boltzmann and Planck laws for radiation, Fourier heat equation for conduction, dimensional analysis, and boundary layer theory for convection.

215 Gas Dynamics (3)

Spring—evening. Theory of gas dynamics including: combustion, shock phenomena, dynamics of flow, and heat transfer for high temperature gases.

235 Hypersonic Fluid Dynamics (3)

Time to be arranged. Small disturbance theory; Newtonian theory; constant-density solutions; thin shock layers; viscous interactions; free molecule and rarefied gas flows.

255 Combustion Processes (3)

Time to be arranged. Thermodynamics of combustion; chemical kinetics; flame propagation; combustion of liquids and solids; detonation processes.

256 Reaction Kinetics (3)

Time to be arranged. Theoretical aspects of kinetics of homogeneous and heterogeneous reactions in gaseous and liquid systems.

REQUIRED AND ELECTIVE COURSES FROM OTHER DEPARTMENTS

On the following pages appears a list of courses, offered in other departments of instruction, which are required in one or more of the engineering curricula.

Courses in the options of the Bachelor of Science in Engineering curriculum are to be selected from the offerings of the department of option with the approval of the executive officer of the department. A complete listing of courses in these departments appears in the general catalogue of the University.

Required elective courses in the humanities and social studies may be selected from the offerings of the following departments of instruction:

| | |
|-------------------------------------|-----------------------------------|
| Art | Romance Languages and Literatures |
| Classical Languages and Literatures | Slavic Languages and Literatures |
| English: | Economics |
| American Literature | Geography |
| English Literature | History |
| Germanic Languages and Literatures | Political Science |
| Philosophy | Sociology and Anthropology |
| Religion | |

Courses offered in these departments are described in the general catalogue of the University.

Electives (other than required electives in the humanities and social studies) taken to fulfill the 140 semester hour degree requirement need not be confined to the above list, but credit is not given for courses in Physical Education or Secretarial Studies. Credit is not given for English A, B; Mathematics 3, 6; or Speech B.

ACCOUNTING

115 *Survey in Accounting* (3)

Accounting systems used by single proprietorships and corporations with emphasis on methods of compiling, analyzing, classifying, and summarizing accounting data; and the use of accounting information in the management process. Not open for credit to Accounting or Business Administration majors.

215 *Survey of Managerial Accounting* (3)

Nature, preparation, analysis, and interpretation of accounting reports; study of cost accounting, business budgeting, and internal accounting controls with emphasis on their use in the management process.

293 *Budget Preparation and Control* (3)

Principles, techniques, and procedures involved in the development, installation, and operation of a system of budgetary control to aid in the management of commercial, industrial, and government organizations.

AIR SCIENCE

BASIC COURSE

1-2 *Leadership Laboratory—Freshman Year* (1-1)

Cadet basic airman training. Military courtesy, discipline, appearance, and bearing; element, flight squadron, and mass formation drill; parades and ceremonies. Minimum 15 hours a semester. Laboratory fee, charged one time a year, \$3.

11-12 *Leadership Laboratory—Sophomore Year* (1-1)

Cadet noncommissioned officer training. Military bearing and courtesy, all phases of drills and ceremonies, command voice training and command responsibility. Prerequisite: Air Science 1-2 and 22 for men; Air Science 1-2 for women. Minimum 15 hours a semester. Laboratory fee, charged one time a year, \$3.

22 *Air Science—Freshman Year* (2)

Foundations of Air Power. General survey of air power to include control, navigation, and propulsion systems; space vehicles; military instruments of national security; and professional opportunities in the United States Air Force.

51 Air Science—Sophomore Year (2)

Foundations of Air Power. General survey of the roots and development of aerial warfare emphasizing the principles of war, concepts of employment of forces, and the impact of changing weapon systems. Treatment of aerial warfare is undertaken to include targets and weapons.

ADVANCED COURSE**101-2 Air Science—Junior Year (1-1)**

Air Force Officer Development. Knowledge and skills required of a junior officer in the Air Force. First half includes staff organization and functions. Second half includes the military justice system. Prerequisite or concurrent registration: Business Administration 102 and 193 which are not to be taken in the same semester of the academic year.

103-4 Leadership Laboratory—Junior Year

(Credit is a part of Air Science 101-2)

Cadet noncommissioned officer and officer training. Wearing of the uniform, parades and ceremonies, commands and command voice. Cadets perform duties involving planning for and supervision of Cadet Corps activities. Emphasis placed on leadership and management proficiency. Minimum 15 hours a semester.

105 Summer Training Unit—Between Junior and Senior Years (required)

Attendance at a four-week Air Force ROTC summer training unit at an Air Force base within continental United States is mandatory. Program consists of familiarization flying, physical training, individual weapons, Air Force base activity and equipment, field exercises, air base problems, and leadership training.

151-52 Air Science—Senior Year (1-1)

First half: weather and navigation. A study of the weather and navigational aspects of airmanship, such as temperature, pressure, air masses, precipitation, weather charts, and dead reckoning navigation. *Second half:* the Air Force officer. A study of materials to help the cadet make a rapid, effective adjustment to active duty as an officer of the United States Air Force. Prerequisite or concurrent registration: Political Science 171 and Geography 146, which are not to be taken in the same semester of the academic year.

153-54 Leadership Laboratory—Senior Year

(Credit is a part of Air Science 151-52)

Cadet officer training. Cadet officers conduct activities of Corps of Cadets through chain of command, instruct subordinates, plan and supervise Cadet Corps training and administration. Preparation for commissioned officer duties. Development of leadership and managerial responsibilities. Minimum 15 hours a semester.

BUSINESS AND PUBLIC ADMINISTRATION**BUSINESS ADMINISTRATION****250 Contract Administration (3)**

Primarily for students in the Engineering Administration program. The administration, negotiation, and renegotiation of contracts between the government and industry for engineering, scientific, and other professional services, facilities, and materials. Contract policies; fixed-price and cost-plus-fixed-fee, bidding, etc.

PUBLIC ADMINISTRATION**213 Administration in Government (3)**

Selected topics in problems of federal administration, with particular attention to the role of Congress and the public in the administrative processes.

CHEMISTRY

11-12 *General Chemistry* (4-4)

A year course; credit is not given for the first half until the second half is completed. Lecture, laboratory, and recitation. Prerequisite: one year of high school algebra. Laboratory fee, \$18 a semester.

ENGLISH

A *English Practice*†

A course in reading and writing designed to assist the foreign student in overcoming deficiencies in the use of English. Special attention is given to spelling, syntax, grammar, idiom, and vocabulary.

B *English for Foreign Students*† (3)

For second-semester foreign students not yet ready for English 1. Writing of expository paragraphs and themes; outlining; reading for comprehension, vocabulary, and style.

1 *English Composition** (3)

Review of grammar, exercise in composition, readings.

1X *English Composition** (3)

An intensive course in English grammar and composition to which are assigned students whose placement tests show them inadequately prepared for the regular work of English 1. The course begins with detailed instruction, drill, and exercises in the basic structure of the English language and in the writing of paragraphs; it continues with the content of English 1. English 1X meets five hours a week and carries 3 semester hours of credit. The tuition fee is \$97 (the regular fee of \$24 a semester hour, plus an additional fee of \$25).

2 *English Composition** (3)

The second half of the six-hour English Composition course required of all students. Readings and practice in expository and argumentative techniques and in research procedure.

MATHEMATICS

3 *College Algebra*† (3)

Exponents and logarithms; linear equations; complex numbers; quadratic equations; introduction to theory of equations; mathematical induction and the binomial theorem; permutations, combinations, and probability; determinants; progressions. Prerequisite: one year each of high school algebra and high school geometry.

6 *Plane Trigonometry*† (3)

Prerequisite: two years of high school algebra and one year of high school geometry or Mathematics 3 (or concurrent registration therefor).

12 *Analytic Geometry* (3)

Prerequisite: Mathematics 3 and 6, or two years of high school algebra, one year of high school geometry, and one-half year of high school trigonometry.

29 *Calculus I* (3)

Differentiation and integration of algebraic and trigonometric functions with applications. Prerequisite or concurrent registration: Mathematics 12.

30 *Calculus II* (3)

Differentiation and integration of transcendental functions with applications, methods of integration, vectors, and parametric equations. Prerequisite: Mathematics 12, 29.

* Before students are registered in English 1, they are tested in the minimum essentials of vocabulary, spelling, grammar, standard usage, and writing skill. Those students who show marked superiority may, upon passing further tests, be exempted from one or both halves of the English Composition course; those who are inadequately prepared for English 1 will be assigned to English 1X. English 1 or 1X is prerequisite to all other courses in English.

† Credit is not given for English A, B; Mathematics 3, 6; or Speech B.

31 Calculus III (3)

Infinite series, partial differentiation, multiple integrals, solid geometry, improper integrals, and differential equations. Prerequisite: Mathematics 30 (or concurrent registration therefor), or Mathematics 20.

111 Mathematics for Engineers and Physicists I (3)

Differential equations, vector analysis, introduction to matrix algebra. Prerequisite: Mathematics 30, 31.

112 Mathematics for Engineers and Physicists II (3)

Topics from advanced calculus, partial differential equations, and complex variables. Prerequisite: Mathematics 111 or 132.

PHYSICS

11 Introductory Physics (3)

An introduction to the phenomena of light, heat, force, energy; introduction to vectors; and the properties of matter. This course may be taken as a terminal course by non-science students who wish an introduction to the physical sciences. Prerequisite: high school algebra and plane geometry. Lecture, laboratory, and recitation. Material fee, \$11.

14 General Physics (3)

Mechanics, wave motion, and sound. Prerequisite: Physics 11. Prerequisite or concurrent registration: Mathematics 29. Lecture, laboratory, and recitation. Material fee, \$11.

15 General Physics (3)

Electricity and magnetism. Prerequisite: Physics 14. Prerequisite or concurrent registration: Mathematics 30. Lecture, laboratory, and recitation. Material fee, \$11.

16 General Physics (3)

Modern physics, molecular structure of matter, structure of the atom. Prerequisite: Physics 13 or 15, Mathematics 30, and consent of the instructor.

116 Quantum and Solid State Physics (3)

Primarily for engineers. Prerequisite: Physics 16, Mathematics 111.

191 Nuclear Reactors (3)

Neutron physics: sources of neutrons, neutron reactions, slowing down and diffusion; introduction to transport theory; fission process; reactor types; basic theory of homogeneous and heterogeneous reactors, including specific numerical studies from recent publications. Prerequisite: Physics 16 or 8, Mathematics 31 or 20.

PSYCHOLOGY

145 Principles of Human Relations (3)

Primarily for students in the Engineering Administration program. Survey of the psychological principles involved in dealing with individuals and groups.

STATISTICS

107 Statistics for Engineers (3)

Simple probability models, discrete and continuous distributions, sampling, hypothesis testing and estimation, nonparametric tests. Emphasis on engineering applications. Prerequisite: differential and integral calculus.

262 Managerial Statistics and Quality Control (3)

Primarily for students in the Engineering Administration program. The application of statistical principles and practices to management and quality control. Emphasis is placed on the use of statistical techniques in making management decisions, controlling quality and standardization. Prerequisite: Statistics 107 or the equivalent.

271-72 Statistical Information Theory (3-3)

A year course; credit is not given for the first half until the second half is completed. Basic concepts, definitions, and formulas of information theory; their significance and general properties. Shannon's coding theorem, channel capacity, and transmission of information; inequalities of information theory and sufficiency; applications to statistical problems of discrimination and hypothesis testing; asymptotic distribution theory of information; analysis of contingency tables; loss of information due to grouping and sequential analysis; comparison of experiments.

ALUMNI AND ALLIED ASSOCIATIONS

THE GENERAL ALUMNI ASSOCIATION

The objectives of this Association are to unite the graduates who wish to associate themselves for charitable, educational, literary, and scientific purposes, and to promote the general welfare of the University.

Eligible members are those who have matriculated in any school of the University and who have left the University in good standing, or any person who is or has been a member of the teaching, research, or administrative staff of the University, or the Board of Trustees of the University. Active members are those eligible members who are current contributors to or life members of The George Washington University General Alumni Association, the Alumni Associations of any school of the University, or contributors to the Alumni Fund.

The Alumni Office is in Bacon Hall, 2000 H Street NW., Washington 6, D. C.

All alumni are urged to keep the Alumni Office informed of changes of address or occupation and to supply information with regard to their fellow alumni.

THE ENGINEER ALUMNI ASSOCIATION OF THE GEORGE WASHINGTON UNIVERSITY

The Engineer Alumni Association was organized in 1936 and has been affiliated with the General Alumni Association since that time. Its objects are to unite the graduates and Faculty of the School of Engineering in closer fellowship, to promote the general welfare of the School of Engineering and of the University at large, to foster activities of the engineering organizations recognized by the University, and to advance the profession of engineering in general.

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THE PHOTOELASTIC POLARISCOPE—FOR ENGINEERING RESEARCH



CLASS BREAK, TOMPKINS HALL OF ENGINEERING

ELECTRONICS—AN ESSENTIAL IN MODERN ENGINEERING



THE GEORGE WASHINGTON UNIVERSITY

Washington 6, D. C.

Academic programs leading to degrees are offered in the following colleges and schools:

- Junior College: Associate in Arts (A.A.) and Associate in Science (A.S.)
Columbian College: Bachelor of Arts (A.B.), Bachelor of Science (B.S.), Bachelor of Science in Medical Technology (B.S. in Med. Tech.), Master of Arts (A.M.), Master of Fine Arts (M.F.A.), and Master of Science (M.S.)
Graduate Council: Doctor of Philosophy (Ph.D.)
School of Medicine: Doctor of Medicine (M.D.)
Law School: Bachelor of Laws (LL.B.), Juris Doctor (J.D.), Master of Laws (LL.M.), Master of Comparative Law (M. Comp. L.), Master of Comparative Law (American Practice) (M. Comp. L. (Am. Prac.)), and Doctor of Juridical Science (S.J.D.)
School of Engineering: Bachelor of Civil Engineering (B.C.E.), Bachelor of Electrical Engineering (B.E.E.), Bachelor of Mechanical Engineering (B.M.E.), Bachelor of Science in Engineering (B.S. in Eng.), Master of Science in Engineering (M.S. in Eng.), Master of Engineering Administration (M.E.A.), and Doctor of Science (D.Sc.)
School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.) and Master of Science in Pharmacy (M.S. in Phar.)
School of Education: Bachelor of Arts in Education (A.B. in Ed.), Bachelor of Science in Home Economics (B.S. in H.E.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (Adv. Prof. Cert.), and Doctor of Education (Ed.D.)
School of Government, Business, and International Affairs: Bachelor of Arts in Government (A.B. in Govt.), Bachelor of Business Administration (B.B.A.), Master of Arts in Government (A.M. in Govt.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)
College of General Studies: Associate in Arts (A.A.(C.G.S.)), Associate in Science (A.S.(C.G.S.)), Associate in Secretarial Administration (A.Sec.Adm.), Bachelor of Arts (A.B.(C.G.S.)), Bachelor of Science in Cartography (B.S. in Cart.), Master of Arts in Controllershship (A.M. in Contr.), Master of Arts in Governmental Administration (A.M. in Govt. Adm.), Master of Arts in International Affairs (A.M. in I.A.), and Master of Arts in Personnel Management (A.M. in Per. Mgmt.)

ANNUAL ISSUES OF THE UNIVERSITY BULLETIN

Requests for the following publications should be addressed as indicated.

| | |
|--|--|
| College of General Studies..... | Dean of the College of General Studies |
| General Catalogue of the University..... | Director of Admissions |
| Graduate Council..... | Dean of the Graduate Council |
| Law School..... | Director of Admissions |
| School of Education..... | Director of Admissions |
| School of Engineering..... | Dean of the School of Engineering |
| School of Medicine..... | Director of Admissions |
| Summer Sessions..... | Dean of the Summer Sessions |
| Fellowships, Scholarships, Prizes, and Financial Aid..... | Chairman, Committee on Scholarships |

THE GEORGE WASHINGTON UNIVERSITY

1821

The Junior College

1930

Columbian College (the Senior College)

1821

The Graduate Council

1893

The School of Medicine

1825

The Law School

1865

The School of Engineering

1884

The School of Pharmacy

1906

The School of Education

1907

The School of Government, Business, and International Affairs

1923

The College of General Studies

1950

The Division of University Students

1930

The Division of Special Students

1944

The Division of Air Science

1951

The Summer Sessions

1916

The University Hospital

1898

THE
GEORGE
WASHINGTON
UNIVERSITY

BULLETIN

THE SCHOOL OF EDUCATION

1961-62



WASHINGTON 6, D. C.

JUNE 1961

VOL. LX

No. 11

CORRESPONDENCE DIRECTORY

Detailed information may be obtained by addressing inquiries as indicated below. For any information not included here, please write to the Director of Admissions, The George Washington University, Washington 6, D. C.

Information concerning courses of instruction and the programs of the several colleges and schools will be found in separate issues of the University Bulletin, which are listed on the inside back cover.

Admission.....Director of Admissions, Building C
 Air Science (ROTC).....Director of Air Science, Chapin Hall
 Alumni Association.....Alumni Office, Bacon Hall
 Foreign Students.....Adviser to Foreign Students, Building T
 Graduate Study

In Arts and Sciences

Master's degrees.....Dean of Columbian College of Arts and Sciences
 Doctor of Philosophy.....Dean of The Graduate Council

In Education.....Dean of The School of Education

In Engineering.....Committee on Graduate Studies, School of Engineering

In Law.....Dean of The Law School

In Accounting, Business Administration, Business and Economic Statistics,
 Economic Policy, Hospital Administration, International Affairs, Personnel
 Administration, Public Administration, Public Affairs.....Dean of
 The School of Government, Business, and International Affairs

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Men.....Director of Men's Activities, Building Q

Women.....Director of Women's Activities, Woodhull House

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Student Employment.....Student Employment Office, 2114 G Street NW.

Summer Sessions.....Dean of the Summer Sessions, Building T

Transcripts of Records.....Registrar, Building C

Veterans Education.....Director of Veterans Education, Building Q

THE SCHOOL OF EDUCATION
1961-62

PUBLISHED BY THE UNIVERSITY
AT WASHINGTON, D. C.
JANUARY, MARCH (2 ISSUES), APRIL (2 ISSUES), JUNE (2 ISSUES), JULY, OCTOBER,
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VOL. LX

No. 11

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WASHINGTON 6, D. C.

PUBLISHED IN JUNE
MCMLXI

BY THE UNIVERSITY

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| November | | | | | | | | May | | | | | | | | November | | | | | | | | | | | |
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| 31 | | | | | | | | | | | | | | | | 30 | 31 | | | | | | | | | | |

CALENDAR OF THE SCHOOL OF EDUCATION

1961-62

1961

FALL SEMESTER:

| | | |
|--|----------------------|---------------|
| Orientation Assembly: all new students..... | Sept. 15 | Fri. |
| Curriculum assemblies: new students attend one | Sept. 15 and 18..... | Fri. and Mon. |
| Placement tests | Sept. 19 | Tues. |
| Registration* | Sept. 21-23 | Thurs.-Sat. |
| Classes begin | Sept. 25 | Mon. |
| Subjects of Master's theses of Feb. candidates due | Oct. 6 | Fri. |
| Dissertation subjects of June Ed.D. candidates due | Oct. 6 | Fri. |
| Fall Convocation | Oct. 21 | Sat. |
| General Education activities plans due from A.B. in Ed. Feb. entrants..... | Oct. 23 | Mon. |
| Application for Feb. graduation due in Registrar's Office | Oct. 31 | Tues. |
| Graduate Studies Committee meets..... | Nov. 3 | Fri. |
| Application for November Ed.D. comprehensive examinations due..... | Nov. 4 | Sat. |
| Veterans Day. Holiday..... | Nov. 11 | Sat. |
| Ed.D. comprehensive examinations..... | Nov. 18 | Sat. |
| Thanksgiving recess | Nov. 23-25 | Thurs.-Sat. |
| Ed.D. and A.M. in Ed. Jan. comprehensive examination applications due..... | Dec. 6 | Sat. |
| Christmas recess | Dec. 22-Jan. 2..... | Fri.-Tues. |

1962

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|--|------------------|-----------|
| Classes resume | Jan. 3 | Wed. |
| Theses and dissertations of Feb. candidates due | Jan. 3 | Wed. |
| Ed.D. and A.M. in Ed. comprehensive examinations | Jan. 6 | Sat. |
| Graduate Studies Committee meets..... | Jan. 19 | Fri. |
| Examination period | Jan. 22-27 | Mon.-Sat. |

SPRING SEMESTER:

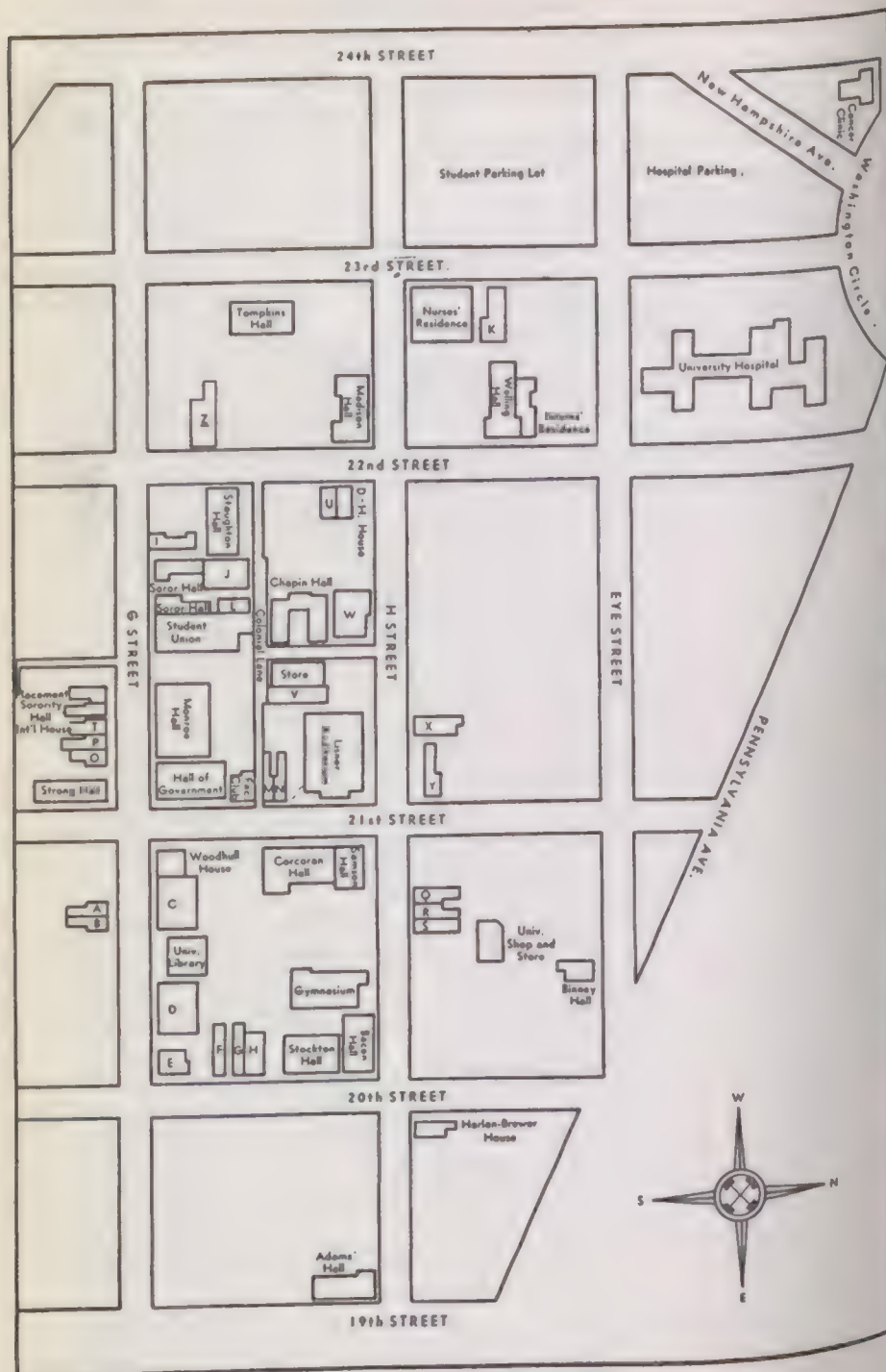
| | | |
|---|----------------|-------------|
| Registration† | Feb. 1-3 | Thurs.-Sat. |
| Spring semester classes begin | Feb. 5 | Mon. |
| Subjects of Master's theses of June candidates due | Feb. 9 | Fri. |
| Winter Convocation | Feb. 22 | Thurs. |
| Application for June graduation due in Registrar's Office | Feb. 23 | Wed. |

* September 21 and 22, from 10:00 A.M. to 8:00 P.M.; September 23, from 10:00 A.M. to 1:00 P.M.

† February 1 and 2, from 10:00 A.M. to 8:00 P.M.; February 3, from 10:00 A.M. to 1:00 P.M.

| | | |
|---|-------------------|-----------|
| Dissertation subjects of Oct. Ed.D. candidates due | March 3 | Sat. |
| General education activities plans due from A.B. in Ed. Feb. entrants..... | March 5 | Mon. |
| Application for 1962-63 scholarships due.... | March 31 | Sat. |
| Dissertation subjects of Feb. 1963 Ed.D. candidates due | March 31 | Sat. |
| Ed.D. dissertations of June candidates due.... | April 6 | Fri. |
| Ed.D. and A.M. in Ed. April comprehensive examination applications due..... | April 14 | Sat. |
| Easter recess | April 20-25 | Fri.-Wed. |
| Master's theses of June candidates due..... | April 27 | Fri. |
| Ed.D. and A.M. in Ed. comprehensive examinations | April 28 | Sat. |
| Graduate Studies Committee meets..... | May 11 | Fri. |
| Examination period | May 21-26 | Mon.-Sat. |
| Memorial Day. Holiday..... | May 30 | Wed. |
| Baccalaureate service | June 3 | Sun. |
| Commencement | June 6 | Wed. |
| SUMMER SESSIONS: | | |
| Twelve-week session: registration and first day of classes for first three-week day class and first six-week evening classes... | June 11 | Mon. |
| Nine-week workshop session: registration for first-block classes | June 18 | Mon. |
| Eight-week session: registration..... | June 18 | Mon. |
| Nine-week workshop session: first-block classes begin | June 19 | Tues. |
| Eight-week classes begin..... | June 19 | Tues. |
| First twelve-week day-class session ends..... | June 29 | Fri. |
| Twelve-week session: registration and first day of classes for second three-week day class | July 3 | Mon. |
| Independence Day. Holiday..... | July 4 | Tues. |
| Nine-week workshop session: registration for second-block three-week classes..... | July 10 | Mon. |
| Six-week session: registration..... | July 10 | Mon. |
| Nine-week session: second-block three-week classes begin | July 11 | Tues. |
| Six-week session: classes begin..... | July 11 | Tues. |
| Ed.D. and A.M. in Ed. July comprehensive examination applications due..... | July 12 | Wed. |
| Twelve-week session: second three-week day class ends | July 20 | Fri. |
| Twelve-week session: first six-week evening classes end | July 20 | Fri. |
| Twelve-week session: registration and first day of classes for third three-week day class and second six-week evening classes.. | July 23 | Mon. |
| Ed.D. and A.M. in Ed. comprehensive examinations | July 25 | Wed. |

| | | |
|---|---------------|------|
| Nine-week session: registration and first day of classes for third-block three-week classes | July 30 | Mon. |
| Applications for Oct. graduation due in Registrar's Office | Aug. 1 | Wed. |
| Graduate Studies Committee meets..... | Aug. 8 | Wed. |
| Eight-week session ends..... | Aug. 10 | Fri. |
| Twelve-week session: third three-week day class ends | Aug. 10 | Fri. |
| Twelve-week session: registration and first day of classes for fourth three-week day class | Aug. 13 | Mon. |
| Nine-week session: third-block three-week classes end | Aug. 17 | Fri. |
| Six-week session ends..... | Aug. 17 | Fri. |
| Twelve-week session: fourth three-week day class and second six-week evening classes end | Aug. 31 | Fri. |
| Ed.D. dissertations of Oct. candidates due.... | Sept. 7 | Fri. |



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† On leave of absence 1961-62.

‡ On leave of absence fall semester 1961-62.

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GENERAL INFORMATION

INTRODUCTORY

It is the purpose of the School of Education to prepare teachers, counselors, and administrators for the higher ranges of educational service and to offer opportunities to teachers of experience to extend their education. The School includes the departments of Education, Physical Education, and Home Economics. It offers both graduate and undergraduate work. Other departments of the University provide general education and subject-matter courses needed for a well-balanced program of teacher education.

Special curricula are provided for liberal arts graduates, housewives, and retired military personnel who wish to prepare for teaching. The School also provides a wide range of courses of interest to emergency teachers who wish to qualify for teaching certificates and teachers who wish to renew licenses.

Laboratory and clinical facilities are provided by the University Reading and Speech clinics. In cooperation with public and private schools and a wide variety of social agencies, ample opportunity for field experience is provided.

The schedule of courses is arranged to meet the convenience of both full-time and part-time students. By attending evening, Saturday, and summer classes, teachers in the schools of the metropolitan Washington area and others within commuting range may complete all the requirements for a degree without giving up their positions.

HISTORICAL DEVELOPMENT

The University began offering professional courses for teachers in 1904-5 and in 1907 it established a Division of Education. In 1909, the Division of Educa-

* The Dean and Assistant Deans of the School of Education are members ex officio of all committees.

† Elected by the Faculty.

‡ Appointed by the Dean.

tion became the Teachers College which, in its early years, was concerned largely with teacher preparation on the undergraduate level.

In 1928, the Teachers College became the School of Education and greater provision was made for advanced study. Since that time the graduate enrollment has steadily increased with the result that today the School has a considerably larger number of graduate than undergraduate students.

ADVANTAGES OF STUDY IN THE NATION'S CAPITAL

Washington is rich in the resources needed by teachers, counselors, and administrators to supplement classroom instruction. In addition to the library facilities of the University, the Library of Congress; the Library of the Department of Health, Education, and Welfare; and many special collections provide unexcelled opportunities for reading and research. The operation of all branches of the National Government may be observed. Among the art galleries are the National Gallery of Art, the Corcoran Gallery of Art, the Freer Art Gallery, Phillips Memorial Gallery, and the National Museum. The music calendar of Washington is a full one, and includes concerts by the National Symphony Orchestra, Philadelphia Orchestra, and the Boston Symphony Orchestra. Those interested in science find many resources for study at the National Museum, the National Zoological Park, the United States Botanic Garden, and the Aquarium of the Fish and Wildlife Service, Department of the Interior. Students have unique opportunities to become acquainted with the work of the Office of Education, the National Education Association, the American Council on Education and many other national organizations with headquarters in Washington.

ACADEMIC STATUS

The George Washington University is accredited by the regional accrediting agency, the Middle States Association of Colleges and Secondary Schools. This is important to students who wish to transfer credits from one institution to another.

The University is on the approved list of the American Association of University Women and is a member of the College Entrance Examination Board.

The School of Education is accredited by the National Council for Accreditation of Teacher Education, is a member of the American Association of Colleges for Teacher Education, and was a charter member of the National Association of Colleges and Departments of Education prior to the merger of that association with others to form the American Association of Colleges for Teacher Education.

THE EDUCATION OF TEACHERS

Programs of study for the education of teachers are based upon the assumption that every teacher should have a broad general education, adequate mastery of the content of instruction, and professional competence.

The relative emphasis placed upon each of these aspects of the total education of teachers varies in accordance with the purposes of each program. For instance, elementary school teachers, since they teach all subjects, require content preparation of greater breadth and less specialization than secondary school teachers.

It is the view of the School of Education that an acceptable minimum education

for teaching requires not less than four years of full-time study or the equivalent part-time study. For superior preparation teachers are urged to plan for five years of full-time study or the equivalent part-time study.

The student may choose any one of the following three plans to achieve superior educational preparation for teaching:

1. Upon receiving the Bachelor's degree, he may take a teaching position and, after acquiring some professional experience, return to the School for graduate study leading to the Master's degree. This plan enables students with Bachelor's degrees to start earning immediately and, by teaching experience, to illuminate graduate study which will follow. However, by delaying acquisition of the Master's degree the student cannot command the higher salary usually associated with this degree and may prejudice his opportunity for promotion.

2. The student may choose to pursue full-time graduate study leading to the Master's degree immediately after receiving the Bachelor's degree. This plan is of advantage to students who wish to defer the decision to seek a Master's degree until completion of the undergraduate program and to students transferring from other institutions, whose transferred credits fit more readily into this plan than into the five-year plan discussed below. Both this program and the five-year program enable the student to command a higher beginning salary and be considered for early promotion.

3. For those whose professional aims are established at the beginning of the junior year, the School offers a five-year integrated program of study leading to the Bachelor's and Master's degrees conferred simultaneously. This program permits careful planning from the outset to meet the demands of the teaching position for which the student is preparing; it permits adequate mastery of the content of instruction in two teaching fields; and advances the professional sequence of courses to the fourth and fifth years, thus providing a more adequate academic preparation. Students are advised to choose the five-year program if possible.

The first two years of all programs of study are administered by Columbian College of Arts and Sciences of the University. During these two college years the student is encouraged to follow the curriculum designed to prepare him for the program of studies he wishes to pursue later in the School of Education. Students who have followed other curricula may be admitted to the School of Education with deficiencies which they must make up before graduation. Members of the Faculty of the School of Education serve as advisers to students enrolled in Columbian College of Arts and Sciences curricula leading to degree programs in the School of Education. At each registration students must have their programs approved by their advisers. They are also urged to seek counsel in the budgeting of time for the inclusion of nonacademic student activities and off-campus cultural opportunities for the development of a well-rounded personality.

THE BACHELOR'S DEGREES

BACHELOR OF SCIENCE IN PHYSICAL EDUCATION*

Bachelor of Science in Physical Education for Men

There are three curricula leading to this degree. The curriculum in Physical Education with an academic Minor is designed to prepare students for teaching

* Physical Education may also be chosen as a minor teaching field by candidates for the degree of Bachelor of Arts in Education. See page 18.

positions in smaller schools where it is necessary to teach an academic subject in addition to physical education. The curriculum in Physical and Health Education prepares for the teaching of physical education in the larger schools. The curriculum in Physical Education and Recreation is planned for those who wish to be prepared to direct programs of recreation in addition to the teaching of physical education.

PREREQUISITE

The following two-year curriculum offered in Columbian College of Arts and Sciences, is required for admission to the School of Education as a candidate for the degree of Bachelor of Science in Physical Education for Men.

| the degree of Bachelor of Science in Physical Education for Men. | | Semester Hours |
|--|---|-------------------|
| English | English 1 or IX, 2..... | 6 |
| Science | Biology 1-2 or Zoology 1-2 (Freshman year)..... | 6 or 8 |
| | Chemistry 3-4 (Sophomore year)..... | 8 |
| Social Studies | History 71-72; Political Science 1 and 9, 1 and 10, or 9-10..... | 6 |
| | Sociology and Anthropology 1-2..... | 6 |
| Major Prerequisites | Physical Education 41, 43-44, 47; Speech 1 or 11 (Freshman year)..... | 10 |
| | Physical Education 45-46, 49, 50, 58; Psychology 1, 22 (Sophomore year)..... | 18 |
| Elective | | 2-4 |
| | Total..... | 64 |

CURRICULUM REQUIREMENTS

The minimum requirements for this degree are 66 semester hours, distributed as follows:

Curriculum in Physical Education With an Academic Minor

| JUNIOR YEAR | | Semester Hours |
|--------------------------------|--|-------------------|
| Education 109-10 | Human Development, Learning, and Teaching..... | 6 |
| Education 121-22 | Society and the School..... | 6 |
| Physical Education 105..... | Adapted Physical Education and Physical Examinations | 3 |
| Physical Education 107..... | Teaching Recreational Dance..... | 1 |
| Physical Education 113-14..... | Practice in Teaching Physical Education..... | 4 |
| Physical Education 121..... | School and Community Health Programs..... | 3 |
| Physical Education 122..... | Methods and Materials for Health Education..... | 3 |
| Physiology 115 | Physiology | 4 |
| Academic Teaching Field..... | | |
| Total..... | | 33 |

| SENIOR YEAR | | Semester Hours |
|--------------------------------|---|-------------------|
| Education 131 | Common Teaching Skills in Secondary Schools..... | 3 |
| Education 134 | Student Teaching in Secondary Schools..... | 6-9 |
| Physical Education 103..... | History and Principles of Physical Education..... | 3 |
| Physical Education 115-16..... | Teaching Team Sports in Secondary Schools..... | 4 |
| Physical Education 131..... | Tests and Measurements in Physical Education..... | 3 |
| Physical Education 138..... | Organization and Administration of Physical Education | 3 |
| Academic Teaching Field..... | | 8-11 |
| Total..... | | 30-36 |

Curriculum in Physical and Health Education

JUNIOR YEAR

| | Semester Hours |
|--|-------------------|
| Education 109-10 Human Development, Learning, and Teaching..... | 6 |
| Education 121-22 Society and the School..... | 6 |
| Physical Education 107..... Teaching Recreational Dance..... | 1 |
| Physical Education 109-10..... Leadership Organization in the Intramural Program.... | 4 |
| Physical Education 113-14..... Practice in Teaching Physical Education..... | 4 |
| Physical Education 121..... School and Community Health Programs..... | 3 |
| Physical Education 122..... Methods and Materials for Health Education..... | 3 |
| Physiology 115 Physiology | 3 |
| Elective | 3 |
| Total..... | 33 |

SENIOR YEAR

| | Semester Hours |
|---|-------------------|
| Education 131 Teaching Skills in Secondary Schools..... | 3 |
| Education 134 Student Teaching in Secondary Schools..... | 6-9 |
| Physical Education 103..... History and Principles of Physical Education..... | 3 |
| Physical Education 105..... Adapted Physical Education and Physical Examinations | 3 |
| Physical Education 115-16..... Teaching Team Sports in Secondary Schools..... | 4 |
| Physical Education 131..... Tests and Measurements in Physical Education..... | 3 |
| Physical Education 138..... Organization and Administration of Physical Education | 3 |
| Elective | 5-8 |
| Total..... | 30-36 |

Curriculum in Physical Education and Recreation

JUNIOR YEAR

| | Semester Hours |
|--|-------------------|
| Education 109 Human Development, Learning, and Teaching..... | 3 |
| Education 121-22 Society and the School..... | 6 |
| Physical Education 48..... Introduction to Recreation..... | 2 |
| Physical Education 107..... Teaching Recreational Dance..... | 1 |
| Physical Education 109-10..... Leadership Organization in the Intramural Program.... | 4 |
| Physical Education 113-14..... Practice in Teaching Physical Education..... | 4 |
| Physical Education 121..... School and Community Health Programs..... | 3 |
| Physical Education 132..... Camp Leadership | 1 |
| Physical Education 151-52..... Recreational Leadership Activities..... | 6 |
| Elective | 3 |
| Total..... | 33 |

SENIOR YEAR

| | Semester Hours |
|---|-------------------|
| Education 131 Teaching Skills in Secondary Schools..... | 3 |
| Education 134 Student Teaching in Secondary Schools..... | 6-9 |
| Physical Education 103..... History and Principles of Physical Education..... | 3 |
| Physical Education 122..... Methods and Materials for Health Education..... | 3 |
| Physical Education 131..... Tests and Measurements in Physical Education..... | 3 |
| Physical Education 138..... Organization and Administration of Physical Education | 3 |
| Physical Education 161..... Community Organization for Recreation..... | 3 |
| Physical Education 162..... Administration of Community Recreation Programs..... | 3 |
| Elective | 3-6 |
| Total..... | 30-36 |

Bachelor of Science in Physical Education for Women

The Physical Education major curriculum is designed to prepare students for teaching in elementary and secondary school programs of physical education.

Geology 1-2: Introductory Geology
 Physics 11, 12: Introductory Physics
 Zoology 1-2: Introduction to Zoology

(A student offering for admission two or more acceptable senior high school units in the above areas of science may be exempted from one semester of this requirement.)

Mathematics

One semester to supplement senior high school courses chosen from the following

Mathematics 2: General Mathematics
 Mathematics 3: College Algebra
 Mathematics 6: Plane Trigonometry
 Mathematics 12: Analytic Geometry

3

SOCIAL STUDIES

History 71-72: The Development of the Civilization of the United States or Political Science 1 and 9, 1 and 10, or 9-10

6

Another Social Science chosen from the following courses

6

Economics 1-2: Principles of Economics
 Geography 51, 52: Introduction to Geography; World Regions
 History 39-40: The Development of European Civilization
 History 71-72: The Development of the Civilization of the United States
 Political Science 1 and 9, 1 and 10, or 9-10: Introduction to Government; Government of the United States
 Religion 59-60: History of Religion
 Sociology and Anthropology 1-2: Man in Modern Society

(A student offering for admission two or more acceptable senior high school units in the Social Studies may be exempted from this requirement.)

Other Courses

Psychology 1: General Psychology
 Psychology 22: Educational Psychology
 Speech 1: Effective Speaking (or 11: Voice and Diction, if the Department so advises)

3

3

3

Students who demonstrate marked superiority in Speech may be exempted from this requirement. Such exemption is granted only on the recommendation of the Department of Speech.

Academic Electives

Electives may be increased through the various exemptions

Minimum required credits

80

Work experience, leadership activities, participation in student campus activities, and the utilization of off-campus cultural opportunities.—Obviously, these cannot be prescribed. Nevertheless, they constitute an important part of the general educational background of prospective teachers. In conference with a staff member of the Department of Education assigned as his general adviser, the student is expected to plan adequate experiences in these areas. Not later than one month after matriculation in the School of Education the student must file in the Office of the Dean a statement of such plans approved by his adviser. He must also keep his adviser informed concerning the fulfillment of his plans and to this end include in plans filed, scheduled conferences with his adviser.

Success of the student in enriching his general educational background by these means will be taken into consideration at the end of the first semester of the junior year when the faculty will review the qualifications of candidates to determine any who are not of sufficient promise as prospective teachers to warrant continua-

tion of their candidacies. Success in these activities will also be considered when the list of candidates is again reviewed early in the last semester of the senior year immediately after the results of the National Teacher Examinations are available. In estimating the success of the student in this connection, more weight will be given to evidence of initiative, eagerness to make the most of each experience, balance, and quality of experience than to the number of different experiences.

Although the student is not required to establish a program of nonacademic activities until he becomes a degree candidate in the School of Education, he is advised to do so as soon as he enters the University. To this end, he should consult the pre-Education adviser soon after entering. Whatever is accomplished in this connection while in Columbian College of Arts and Sciences will reduce the obligations of the student after admission to the School of Education.

TEACHING-FIELD PREPARATION

Teaching-field preparation depends upon the kind of teaching position for which the student is preparing. Those planning to teach in elementary schools need a degree of competency in several fields. Those preparing to teach in junior or senior high schools, as a rule, must demonstrate competency in a major teaching field and a minor teaching field. With the approval of the student's adviser, preparation in a minor teaching field may be omitted in order to permit additional study in the major teaching field. Ordinarily, students preparing to teach in evening schools for adults are required to prove competency in only one teaching field.

The student should begin teaching-field preparation while in Columbian College of Arts and Sciences and should make provision for it in planning his program of studies.

Teaching-field requirements include satisfactory completion of prescribed academic courses in one or more fields, a satisfactory score on the special field examination of the National Teacher Examinations,* and satisfactory completion of the prescribed special methods courses.

Prescribed academic courses vary in number in accordance with the scope and complexity of the teaching field and the license requirements of the various states. Minimum academic course requirements for each major teaching field are listed on succeeding pages. Minor teaching-field requirements are somewhat less than those of a major field. They are determined in conference with an adviser. Students preparing to teach on the elementary level are advised to use free electives to increase their mastery of content in an academic field or an area of specialization, e.g.—Physical Education, etc.

The prescribed course in special methods is concerned primarily with methods of initiating, guiding, and evaluating learning experiences dealing with the content of the teaching field. It attempts to bring to the student specific suggestions drawn from the accumulated experience of successful teachers. However, in addition, the course reviews the teaching-field content currently in use in schools and the examination at the end of the course provides the final test of competency in the teaching field.

* Special field examinations of the National Teacher Examinations are available in Elementary Education, English Language and Literature, Social Studies, Biological Science, Physical Science, Mathematics, French, Spanish, and Physical Education. Students preparing to teach in fields in which special National Teacher Examinations field examinations are not available (Art, Business Education, Chemistry, Geography, German, History, Home Economics, Physics, Russian, and Speech) must obtain a satisfactory score on a special field examination given by the instructor in the special methods course involved.

Prescribed Courses in the Various Teaching Fields

| ART | | Semester Hours |
|---|--|-------------------|
| Six semester hours from the following..... | | 6 |
| Art 1: Art Appreciation | | |
| Art 31-32: Survey of Western Art | | |
| Art 71-72: Introduction to the Arts in America | | |
| Art 101: Ancient Art | | |
| Art 102: Medieval Art | | |
| Art 107: Eighteenth Century Art in Europe | | |
| Art 109: Nineteenth Century Art in Europe | | |
| Art 110: Contemporary Art | | |
| Art 113: Baroque Art in Italy | | |
| Six semester hours from the following..... | | 6 |
| Art 105: Renaissance Art in Italy | | |
| Art 106: Renaissance Art in the North | | |
| Art 111: Classical Archeology | | |
| Art 112: Archeology of the Ancient Orient | | |
| Art 203: Primitive Art | | |
| Art 204: Art of the Far East | | |
| Art 210: Christian Iconography | | |
| Twenty-four semester hours from the following..... | | 24 |
| Art 21-22: Basic Composition and Techniques | | |
| Art 41-42: Drawing and Perspective | | |
| Art 65-66: Drawing and Painting I—Life, Still Life, and Portrait | | |
| Art 81-82: Sculpture I | | |
| Art 125-26: Drawing and Painting II—Life, Still Life, and Portrait | | |
| Art 127-28: Drawing and Painting II—Life and Portrait | | |
| Art 157-58: Print Making | | |
| Art 165-66: Drawing and Painting II—Life and Portrait | | |
| Art 175-76: Advanced Composition | | |
| Art 179-80: Sculpture II | | |
| Art 183-84: Commercial Art | | |
| Total..... | | 36 |
| BIOLOGY | | |
| Biology 1-2: Survey in Biology..... | | 6 |
| Biology 127: Genetics or | | 3-6 |
| Biology 107-8: Organic Evolution | | 6 |
| Botany: (Advanced courses as approved by the adviser)..... | | 8 |
| Chemistry 11-12: General Chemistry | | 3 |
| Physiology 115: Physiology | | 1 |
| Physiology 117: Experimental Physiology | | 6 |
| Physics 11, 12: Introductory Physics..... | | 6 |
| Zoology 41-42: Comparative Vertebrate Anatomy..... | | 6 |
| Zoology 101-2: Invertebrate Zoology | | 6 |
| Total..... | | 45-48 |
| BUSINESS EDUCATION | | |
| Accounting 1: Introductory Accounting..... | | 3 |
| Economics 1-2: Principles of Economics..... | | 6 |
| Secretarial Studies 51: Business Correspondence..... | | 3 |
| Additional courses, as prescribed, in one of the following groups: | | |
| Group 1—Secretarial Studies* | | 3 |
| Secretarial Studies 2: Intermediate Typewriting | | 3 |
| Secretarial Studies 12: Intermediate Shorthand and Transcription..... | | |

* Candidates inadequately prepared for Secretarial Studies 2 or 12 may be required to take Secretarial Studies 1 or 11. In such cases, with the approval of the adviser, credit earned for Secretarial Studies 1 or 11 may be substituted for a teaching field elective.

Semester
Hours

| | |
|--|----|
| Secretarial Studies 15: Advanced Shorthand, Typewriting, and Transcription | 3 |
| Secretarial Studies 54: Secretarial Practice | 3 |
| *Additional courses from the following, as approved by the adviser..... | 6 |
| Accounting 2: Introductory Accounting | |
| Business Administration 101: Introduction to Business | |
| Business Administration 109: Office Management | |
| Business Administration 141: Principles of Marketing | |
| Business Administration 151: Retail Store Management | |
| Business Administration 161: Commercial Law, Contracts, Sales, Agency, and Bailments | |
| Economics 121: Money and Banking | |
| Statistics 52: Mathematics of Finance | |
| Total..... | 30 |
| Group 2—Bookkeeping, Business Arithmetic, and Business Law | |
| Accounting 2: Introductory Accounting..... | 3 |
| Business Administration 101: Introduction to Business..... | 3 |
| Business Administration 102: Fundamentals of Management..... | 3 |
| Business Administration 161: Commercial Law: Contracts, Sales, Agency, and Bailments | 3 |
| Business Administration 162: Commercial Law: Negotiable Instruments, Property, Mortgages | 3 |
| Statistics 52: Mathematics of Finance..... | 3 |
| *Six semester hours from the following, as approved by the adviser..... | 6 |
| Accounting 111: Financial Statement Analysis | |
| Business Administration 121: General Insurance | |
| Business Administration 131: Business Finance | |
| Business Administration 138: Investments | |
| Economics 121: Money and Banking | |
| Total..... | 36 |
| Group 3—Distributive Education | |
| Business Administration 141: Principles of Marketing..... | 3 |
| Business Administration 142: Marketing Management Problems..... | 3 |
| Business Administration 145: Sales Management | 3 |
| Business Administration 151: Retail Store Management..... | 3 |
| *Twelve semester hours from the following, as approved by the adviser..... | 12 |
| Business Administration 147: Advertising | |
| Business Administration 150: Procurement and Materials Management | |
| Business Administration 158: Traffic Management | |
| Business Administration 175: Introduction to Foreign Trade | |
| Business Administration 176: Exporting and Importing | |
| Total..... | 36 |
| CHEMISTRY | |
| Chemistry 11-12: General Chemistry | 8 |
| Chemistry 21: Qualitative Inorganic Analysis..... | 4 |
| Chemistry 22: Quantitative Inorganic Analysis I..... | 4 |
| Chemistry 151-52: Organic Chemistry | 8 |
| Chemistry 191: History of Chemistry..... | 2 |
| Mathematics 6: Plane Trigonometry | 3 |
| Mathematics 12: Analytic Geometry | 3 |
| Physics 11, 12, 13: Introductory Physics..... | 9 |
| Total..... | 41 |

* Not required for the minor teaching field.

| ELEMENTARY EDUCATION | | Semester Hours |
|--|--|-------------------|
| Education 113: Elementary School Art..... | | 3 |
| Education 114: Elementary School Music..... | | 3 |
| Geography 51, 52: Introduction to Geography, World Regions..... | | 6 |
| History 71-72: Development of the Civilization of the United States..... | | 6 |
| Mathematics 2: General Mathematics..... | | 3 |
| Physical Education 101: Physical Education in Elementary School..... | | 3 |
| Science, as approved by adviser..... | | 9-12 |
| Six semester hours from the following, as approved by the adviser..... | | 6 |
| Economics 1-2: Principles of Economics | | |
| History 39-40: Development of European Civilization | | |
| Political Science 9-10: Government of the United States | | |
| Religion 59-60: History of Religion | | |
| Sociology and Anthropology 1-2: Man in Modern Society | | |
| Total..... | | 39-42 |
| ENGLISH | | |
| English 1 or 1X, 2: English Composition..... | | 6 |
| English 52: Introduction to English Literature..... | | 3 |
| English 71-72: Introduction to American Literature..... | | 6 |
| English 125: Introduction to English Linguistics..... | | 3 |
| English 135-36: Shakespeare..... | | 6 |
| Speech 11: Voice and Diction..... | | 3 |
| *Nine semester hours from the following, as approved by the adviser..... | | 9 |
| English 151-52: The Romantic Movement | | |
| English 161-62: Victorian Literature | | |
| English 165-66: The Twentieth Century | | |
| English 170: The American Short Story | | |
| English 171-72: Studies in American Literature | | |
| English 173-74: Major American Poets | | |
| English 176: American Drama | | |
| English 177-78: American Fiction | | |
| English 182: The English Novel | | |
| English 183-84: The English Drama | | |
| Total..... | | 36 |
| FRENCH | | |
| French 1-2: First-year French..... | | 6 |
| French 3-4: Second-year French..... | | 6 |
| French 9-10: French Conversation and Composition..... | | 6 |
| French 51-52: Survey of French Literature and Civilization..... | | 6 |
| *Additional courses in French, as approved by the adviser..... | | 12 |
| Total..... | | 36 |
| GENERAL SCIENCE† | | |
| Chemistry 11-12: General Chemistry..... | | 8 |
| Chemistry 21: Qualitative Inorganic Analysis..... | | 4 |
| Physics 11, 12, 13: Introductory Physics..... | | 9 |
| Physics 16: General Physics..... | | 3 |
| Nine semester hours from the following..... | | 9 |
| Mathematics 3: College Algebra | | |
| Mathematics 6: Plane Trigonometry | | |
| Mathematics 12: Analytic Geometry | | |
| Mathematics 29, 30, 31: Calculus I, II, III | | |

* Not required for the minor teaching field.

† May not be chosen as a minor field.

| | Semester Hours |
|---|-------------------|
| One of the following..... | 6-8 |
| Biology 1-2: Survey in Biology..... | |
| Botany 1-2: General Botany..... | |
| Zoology 1-2: Introduction to Zoology..... | |
| Total..... | 39-41 |
| GEOGRAPHY | |
| Geography 51: Introduction to Geography..... | 3 |
| Geography 52: World Regions..... | 3 |
| Geography 103-4: Cartography..... | 6 |
| Geography 115-16: Physical Geography..... | 6 |
| Geography 145: World Cultural Geography..... | 3 |
| Geography 146: World Political Geography..... | 3 |
| *Six semester hours from the following..... | 6 |
| Geography 183: Western Europe..... | |
| Geography 184: The Mediterranean..... | |
| Geography 191: Latin America..... | |
| Geography 195: Eastern and Southeastern Asia..... | |
| Geography 197: The Pacific..... | |
| Geography 198: Australia..... | |
| *Six semester hours from the following..... | 6 |
| Geography 125: Transportation Complexes..... | |
| Geography 126: World Food Supply..... | |
| Geography 133: Regional Industrial Structures..... | |
| Geography 134: Location of Industry..... | |
| Geography 145: World Cultural Geography..... | |
| Geography 146: World Political Geography..... | |
| Total..... | 36 |
| GERMAN | |
| German 1-2: First-year German..... | 6 |
| German 3-4: Second-year German..... | 6 |
| German 9-10: German Conversation and Composition..... | 6 |
| German 51-52: Introduction to German Literature..... | 6 |
| *Additional courses in German, as approved by the adviser..... | 12 |
| Total..... | 36 |
| HISTORY | |
| History 39-40: The Development of European Civilization..... | 6 |
| History 71-72: The Development of the Civilization of the United States..... | 6 |
| Six semester hours from three of the following groups, as approved by the adviser..... | 18 |
| Group 1—American History..... | |
| History 170: American Colonial History..... | |
| History 171-72: Social History of the United States..... | |
| History 173: Representative Americans..... | |
| History 174: Economic History of the United States..... | |
| History 175-76: Political and Constitutional History of the United States..... | |
| History 181-82: Diplomatic History of the United States..... | |
| History 183: Oversea Expansion of the United States..... | |
| Group 2—European History..... | |
| History 109: Intellectual History of the Western World I: the Classical World..... | |
| History 110: Intellectual History of the Western World II: The Middle Ages and Renaissance..... | |
| History 130: Nationalism..... | |
| History 131-32: History of Germany..... | |

* Not required for the minor.

| | |
|---|--------------|
| History 141-42: History of France | |
| History 143: History of Old Russia | |
| History 147: Economic History of Europe | |
| History 149-50: European Diplomatic History | |
| History 151-52: English History | |
| Group 3—The Eastern World | |
| History 143: History of Old Russia | |
| History 145-46: History of New Russia | |
| History 190: History of India | |
| History 193: History of the Near East | |
| History 195-96: History of the Far East | |
| Group 4—Latin American History | |
| History 163: Colonial Latin America | |
| History 164: South America since Independence | |
| History 166: Mexico and the Caribbean since Independence | |
| Political Science 177: Recent Trends in Latin American Politics and Government | |
| Political Science 178: International Politics in the Western Hemisphere | |
| *Additional semester hours from one of the foregoing groups, as approved by the adviser | 6 |
| Research Seminar (see adviser—Department of History) | 6 |
| Total | 42 |
| MATHEMATICS | |
| Mathematics 3: College Algebra | 3 |
| Mathematics 6: Plane Trigonometry | 3 |
| Mathematics 12: Analytic Geometry | 3 |
| Mathematics 29, 30, 31: Calculus I, II, III | 9 |
| *Mathematics 101: Introduction to Mathematical Logic | 3 |
| *Mathematics 122: Introduction to Abstract Algebra | 3 |
| *Mathematics 139: Advanced Calculus I | 3 |
| *An additional course in Mathematics, as approved by the adviser | 3 |
| Total | 30 |
| PHYSICAL EDUCATION† | |
| Biology 1-2: Survey in Biology or | 6-8 |
| Zoology 1-2: Introduction to Zoology | 3 |
| Physiology (as approved by the adviser) | 4 |
| Physical Education 43-44: Techniques of Physical Education Motor Activities | 3 |
| Physical Education 49: Human Anatomy | 3 |
| Physical Education 50: Kinesiology | |
| Physical Education 51-52‡ (women): Teaching Physical Education Activities or | 4 |
| Physical Education 115-16‡ (men): Teaching Team Sports in Secondary Schools | 1 |
| Physical Education 107: Teaching Recreational Dance | 4 |
| Physical Education 113-14§: Practice in Teaching Physical Educational Activities | 1 |
| Physical Education 117‡ (women): Teaching Modern Dance | 3 |
| Physical Education 122: Methods and Materials for Health Education | |
| Physical Education 138‡: Organization and Administration of Physical Education | 3 |
| Total | 27-32 |
| PHYSICS | |
| Physics 11: Introductory Physics | |
| Physics 14, 15, and 16: General Physics | |

* Not required for the minor teaching field.

† May be chosen as a minor field only.

‡ Required only of those preparing to teach on the secondary school level.

§ Required only of those preparing to teach on the elementary school level.

| | Semester Hours |
|---|-------------------|
| Physics 101: Mechanics | 3 |
| Physics 105: Principles of Electricity..... | 3 |
| Physics 106: Optics | 3 |
| *Chemistry Elective—Chemistry 11-12: General Chemistry or Chemistry 12 and 21: General Chemistry and Qualitative Inorganic Analysis... | 8 |
| Mathematics 12: Analytic Geometry | 3 |
| Mathematics 29, 30, 31: Calculus I, II, III..... | 9 |
| *Six semester hours from the following..... | 6 |
| Physics 102: Heat and Thermodynamics | |
| Physics 113: Atomic Physics | |
| Physics 114: Statistical Physics | |
| Physics 128: Sound | |
| Physics 132: Electronics | |
| Physics 155: Advanced Laboratory in Electricity and Magnetism | |
| Physics 156: Advanced Laboratory in Optics | |

Total..... 47

RUSSIAN†

| | |
|---|---|
| Russian 1-2: First-year Russian | 6 |
| Russian 3-4: Second-year Russian | 6 |
| Russian 9-10: Russian Conversation | 6 |
| Additional courses chosen from the following with permission of the adviser.... | 6 |
| Russian 91-92: Introduction to Slavic Literature | |
| Russian 101-2: Rapid Readings in Russian | |
| Russian 141-42: Russian Literature of the 19th Century | |
| Russian 151-52: Russian Literature of the 20th Century | |

Total..... 24

SOCIAL STUDIES

| | |
|---|----|
| History 39-40: The Development of European Civilization..... | 6 |
| History 71-72: The Development of the Civilization of the United States..... | 6 |
| Political Science 9-10: Government of the United States..... | 6 |
| Twelve semester hours from the following..... | 12 |
| Economics 1-2: Principles of Economics | |
| Geography 51, 52: Introduction to Geography; World Regions | |
| Religion 59-60: History of Religion | |
| Sociology and Anthropology 1-2: Man in Modern Society | |
| *Additional second-group courses, as approved by the adviser, from one of the following fields: Economics, Geography, History, Political Science, Religion, Sociology and Anthropology..... | 12 |

Total..... 42

SPANISH

| | |
|---|----|
| Spanish 1-2: First-year Spanish | 6 |
| Spanish 3-4: Second-year Spanish | 6 |
| Spanish 9-10: Spanish Conversation and Composition..... | 6 |
| *Additional courses, as approved by the adviser..... | 18 |

Total..... 36

SPEECH

| | |
|--------------------------------------|---|
| Speech 1: Effective Speaking | 3 |
| Speech 2: Persuasive Speaking | 3 |
| Speech 11: Voice and Diction..... | 3 |
| Speech 32: Oral Reading | 3 |
| Speech 101: Voice and Phonetics..... | 3 |

* Not required for the minor teaching field.

† May be chosen as a minor teaching field only.

| | Semester Hours |
|---|-------------------|
| Speech 121: Group Discussion and Conference Leadership..... | 3 |
| Speech 153: Acting | 3 |
| Speech 171: Introduction to Speech Correction..... | 3 |
| One of the following areas of specialization, as approved by the adviser: | |
| *Group 1—Speech Arts | 12 |
| Twelve semester hours from the following..... | |
| Speech 102: Oral Interpretation of Literature | |
| Speech 126: Public Discussion and Debate | |
| Speech 154: Play Production | |
| Speech 166: History of the Theater | |
| Speech 169-70: Creative Dramatics and Children's Theater | |
| *Group 2—Speech Correction | 12 |
| Twelve semester hours from the following..... | |
| Speech 173-74: Speech Therapy | |
| Speech 176: Speech Correction | |
| Speech 177-78: Clinical Practice in Speech Therapy | |
| Speech 182: Hearing Problems and the Testing of Hearing | |
| Speech 183-84: Clinical Practice in Hearing Therapy | |
| Additional courses in English, Physiology, Psychology, or Speech, as approved by the adviser | |

Total..... 36

Professional Education

The basic professional information, skills, and attitudes needed by beginning teachers are provided through a sequence of courses to be taken in the junior and senior years. Lectures and class discussions are closely coordinated with field work. Instruction is differentiated to meet the needs of those preparing to teach on the various levels—elementary school, junior high school, senior high school, and adult.

| PROFESSIONAL COURSES—SECONDARY | | Semester Hours |
|---|--|-------------------|
| Education 109-10: Human Development, Learning, and Teaching..... | | 6 |
| Education 112: Educational Measurement or | | 3 |
| Statistics 104: Statistics in Psychology and Education I..... | | 6 |
| Education 121-22: Society and the School..... | | 3 |
| Education 131: Common Teaching Skills in Secondary Schools..... | | 6-9 |
| Education 134: Student Teaching in Secondary Schools..... | | 3-6 |
| Three to six semester hours from the following Special Methods courses..... | | |
| Education 136: Teaching English | | |
| Education 138: Teaching Social Studies | | |
| Education 140: Teaching Mathematics | | |
| Education 144: Teaching Science | | |
| Education 146: Teaching Foreign Languages | | |
| Education 148: Teaching Home Economics | | |
| Education 150: Teaching Business Subjects | | |

Total..... 27-33

| PROFESSIONAL COURSES—ELEMENTARY | | |
|--|--|------|
| Education 109-10: Human Development, Learning, and Teaching..... | | 6 |
| Education 111: Methods in Elementary Education..... | | 6-12 |
| Education 112: Educational Measurement or | | 3 |
| Statistics 104: Statistics in Psychology and Education I..... | | 6 |
| Education 121-22: Society and the School..... | | 9 |
| Education 135: Student Teaching in Elementary Schools..... | | |
| Total..... | | 36 |

* Not required for the minor.

Human Development, Learning, and Teaching.—Students enrolled in the four-year programs leading to the degree of Bachelor of Arts take this course in the junior year. Those enrolled in five-year programs take it in the senior year.

This course attempts to promote a functional understanding of (1) the nature of human growth, development, and learning, illustrated by observation of children in learning situations; (2) the nature of teaching based on principles of human growth, development, and learning, illustrated by observation of school situations. At least an equal amount of time is spent in observation and study of the application of these characteristics and principles to classroom situations. Class discussion normally revolves around these field experiences.

The course is also intended to provide the student with exploratory experiences of assistance to him in deciding whether to choose the profession of teaching. The student's performance in connection with the course is one of the factors considered when the Faculty reviews the list of candidates who have completed the first semester of the junior year (senior year for those enrolled in five-year programs).

Society and the School.—This course is also taken in the junior year by candidates enrolled in four-year programs (senior year by those in five-year programs).

The first half of the course attempts to promote an understanding and appreciation of the role of schools in the sound promotion of the enduring interests of our democratic society. More particularly, it attempts to develop a functional understanding of the contributions of all social agencies in the education of people and of desirable cooperative working relations that help the school to play its part as a member of the institutional "team" of the community.

The second half of the course is concerned with study of the school as a whole—its purposes, program of studies, out-of-class activities, general organization, and major instructional problems. Although schools at all levels are studied, students give particular attention to schools at the level within which they are preparing to teach.

Classes meet for lecture and discussion for one two-hour meeting each week. At least an equal amount of time is spent in field study. During the first half each student studies cooperating social institutions. In the second half extended study of schools at the level of the student's special interest is supplemented by briefer studies of schools at other levels. Class discussion is largely determined by field experiences.

This course is also intended to provide the student with exploratory experiences of guidance value. The performance of the student in the first half of the course is also given careful consideration by the Faculty in its review of the list of candidates at the beginning of the second semester of the junior year (senior year for those enrolled in five-year programs).

Common Teaching Skills in Secondary Schools.—Those enrolled in four-year programs take this course in the senior year. Those enrolled in five-year programs take it in the fifth year.

The course is concerned with the skills needed by teachers in connection with classroom management, teaching techniques, homeroom procedures, administrative routines, activity sponsorship, group planning, and public relations.

Classes meet for two one-hour meetings each week for lecture and discussion. At least an equal amount of time is spent in field study.

Special Methods Courses in Secondary Schools.—Associated with each teaching field is a course dealing with its special teaching problems. In addition to the study of practices followed by successful teachers, actual teaching content as found in

current texts and courses of study is reviewed. Needed content, not included in academic courses available for teaching-field preparation, is taught in these courses.

Student Teaching in Secondary Schools.—This course is taken in the senior year by students enrolled in four-year programs (in the fifth year by those in five-year programs).

It begins with the observation of classroom teaching in selected situations. Assumption of responsibility for teaching functions is gradual, leading eventually to practice in the complete direction of classroom activities. Those preparing to teach in secondary schools have the opportunity of observing and doing practice teaching in both major and minor teaching fields on the senior high school level. The course is directed by full-time members of the faculty of the School of Education. The work of each student is under the direct supervision of a critic teacher, selected because of unusual success in teaching, ability to supervise, and broad understanding of educational problems. Critic teachers are part-time members of the instructional staff of the School. Student teaching is done in the public schools of the metropolitan area of Washington, assuring practice in situations comparable to those the student is likely to face on becoming a teacher.

Methods in Elementary Education.—Those enrolled in four-year programs take this course in the fall semester of the senior year. Those enrolled in five-year programs take it in the fall semester of the fifth year.

The course offers an integrated approach to general and special methods of instruction in elementary schools. It includes discussion of general skills needed in classroom management, administrative duties, group planning, and public relations. Special techniques of instruction include those needed in teaching arithmetic; science; social studies; and the language arts (reading, literature for children, oral and written expression, spelling, and handwriting). The planning of units of work and the evaluation of pupil progress are also discussed.

Students are required to devote each morning to the prescribed activities of this course. Three mornings a week (9:00–12:00 A.M.) are normally devoted to lectures and discussions by three staff members of the Department of Education. Two mornings a week are spent in observation of and participation in classroom instruction in cooperating public schools of the Metropolitan Area.

Educational Measurement.—Those enrolled in four-year programs usually take this course in the senior year. Those enrolled in five-year programs take it in the fifth year.

The course is concerned with ways of discovering and appraising student needs, the selection of pertinent tests, the construction of teacher-made objective and essay-type tests, and the interpretation of test results for guidance purposes.

The course meets for two hours once a week for classroom instruction. Out-of-class assignments include practice in the construction, administration, and scoring of tests.

Student Teaching in Elementary Schools.—This course is taken in the senior year by students enrolled in four-year programs and in the fifth year by those enrolled in five-year programs.

Students who have not had previous teaching experience are normally assigned to student teaching for a period of twelve weeks. At the request of the student, this assignment may be divided between two different grade levels. An attempt is made to arrange a student-teaching placement in a school system within the Metropolitan Area of Washington and at the grade levels most appropriate in view of ultimate

employment aims. Guidance is provided as the student learns to assume responsibility for the major teaching activities.

Students are not asked to take complete charge of a class at the beginning of the student-teaching period. Assumption of full responsibility for teaching activities is gradual and is preceded by an initial period of guided participation and instruction. Toward the end of his assignment the student teacher takes full charge of the class for a considerable period.

Each student is supervised by a member of the Faculty of the School of Education. A cooperating teacher, chosen for proven teaching ability and the capacity to carry on a satisfactory supervisory relationship, is in direct charge of the student-teaching experience.

Special Curricula in Elementary Education

Students preparing for elementary school teaching may also qualify as teachers of French, Spanish, remedial speech, and physical education. Programs should be planned in conference with an adviser.

ATTITUDES NEEDED FOR SUCCESS IN TEACHING

The development of attitudes that motivate professional behavior consistent with the nature of the learning-teaching process is basic to success in teaching. Among the most important of these attitudes are: appreciation of the role of learning in human improvement, respect for intellectual proficiency and true scholarship, objective thinking, and a sense of mission as a member of an important profession.

The responsibility for developing and strengthening attitudes favorable to success in teaching is shared by all parts of the program of teacher education. General education provides a foundation of information essential to an understanding of the course of human events, skills that promote effective social intercourse, the bases of perspective, and an appreciation of cultural development. Teaching-field preparation stimulates intellectual curiosity and respect for objective scholarship in contrast to rationalization. Professional education is organized in a sequence of learning activities primarily based upon the results of research concerning the ways in which the learner grows and develops.

To help students understand the role of education in society and human development and, thus, strengthen a sense of mission and pride in becoming members of the teaching profession, professional courses are closely related to field experiences, and students are encouraged to discuss freely varying viewpoints concerning goals and the interpretation of research data.

Since individual needs in the development of attitudes vary widely, students are encouraged to confer frequently with staff members. Conference hours are designated for this purpose.

FIVE-YEAR PROGRAMS LEADING TO THE DEGREES OF BACHELOR OF ARTS AND MASTER OF ARTS IN EDUCATION

Five-year programs are designed: to permit more adequate teaching-field and professional preparation, to prepare for special teaching positions, and to meet teaching-certificate requirements based upon five years of preparation.

Students in these programs usually devote the junior year to additional teaching-field preparation and general education. Ordinarily, teaching-field preparation is continued in the senior year and the first two professional courses (Education 109-

10, 121-22) are taken. The work of the fifth year includes the remaining undergraduate professional courses and the balance of graduate courses needed to meet the requirements of the degree of Master of Arts.

Candidates must have a quality-point index of at least 2.50 before beginning the work of the senior year. As much as 18 semester hours of the work of the senior year may be taken for graduate credit. Student Teaching in Secondary Schools, and Student Teaching in Elementary Schools taken in the fifth year, may not be taken for graduate credit.

Candidates enrolled in five-year programs on the secondary school level are able to prepare more adequately in their major or minor teaching fields, or in both. Additional teaching-field courses must be approved by the adviser in the teaching field concerned.

The five-year plan of study also provides an opportunity for candidates to prepare to teach "common learnings" courses in one or more of the various core curriculum plans now found in many secondary schools. Such programs need to be carefully planned to meet the demands of the situation in which the candidate hopes to teach.

A number of cities and some states require five years of satisfactory preparation before issuing certain teaching certificates. Candidates seeking such certificates should familiarize themselves with the requirements of the school system or state concerned and plan their programs accordingly.

Candidates enrolled in five-year programs on the elementary school level are able, in addition to preparation as regular classroom teachers, to prepare for special positions such as: teacher of a foreign language, specialist in remedial speech, specialist in remedial reading, and itinerant teacher of Physical Education.

Five-year programs must meet all the requirements of the degrees of Bachelor of Arts and Master of Arts in Education, and must be approved by the adviser designated for these programs.

THE DEGREE OF MASTER OF ARTS IN EDUCATION

Programs of study leading to the degree of Master of Arts in Education are designed to enable prospective teachers and teachers of experience to increase their knowledge of professional and academic information and skills, prepare for special types of educational service, and provide opportunities for graduates of liberal arts or other nonteacher education institutions to acquire needed professional education.

From the various related departments of the University, the student and his adviser select courses to give the student an adequate background in his chosen field of service. The prospective high school or junior high school teacher will ordinarily include study in the subject which he is planning to teach as well as in professional education.

Programs for teachers-in-service and experienced teachers planning to re-enter the profession are differentiated from those for students without teaching experience. Additional information concerning these programs may be obtained by writing or telephoning to the Dean.

Graduate programs of study are available in the following fields: (1) adult education, (2) classroom teaching—to include strengthening mastery of teaching field, (3) comparative education, (4) curriculum, (5) elementary education, (6) employee training, (7) guidance, (8) history of education, (9) philosophy of education, (10) reading, (11) school administration—secondary or elementary school principalship, and (12) secondary education.

ADMISSION TO CANDIDACY

To be admitted to candidacy for the degree of Master of Arts in Education the applicant must (1) hold a Bachelor's degree from an accredited institution, (2) have an undergraduate quality-point index of 2.50 or above (C+ average), (3) have demonstrated a genuine interest in teaching, and (4) have personality traits that give promise of better than average success as a teacher. Those wishing to prepare for careers in guidance or administration must have had at least two years of successful teaching experience. Candidates whose undergraduate preparation does not include equivalents of the basic requirements at the Bachelor of Arts in Education must make up deficiencies.

ADVANCED STANDING

For the record, advanced standing is granted for approved courses taken at other accredited institutions, but a minimum of 30 semester hours must be completed at this University as a matriculated candidate for the degree.

Advanced courses completed in this University in excess of the requirements for the Bachelor's degree may be credited toward the Master's degree to the extent of 12 semester hours, if the work fits in with the student's plan of specialization and is approved in writing by the Dean before being undertaken.

Advanced standing is not granted for work completed three or more years before application for admission or readmission to Master's candidacy.

REQUIREMENTS FOR THE DEGREE

PLAN OF STUDY

The plan of study leading to the degree of Master of Arts in Education requires a minimum of 33 hours of graduate credit. The plan may, at the student's option, include a thesis carrying 6 hours of graduate credit. Whether or not a student selects the thesis option, a minimum of 18 hours, including a course in educational research methods and procedures, must be from courses planned primarily for graduate students (third group courses). A minimum of 12 hours, not including the thesis or the research course must be from courses offered by the Department of Education.

Programs may include additional teaching-field preparation. In such cases, however, undergraduate and graduate courses combined must be at least equivalent to the undergraduate requirements for the degree of Bachelor of Arts in Education (see pages 10-23).

Programs are planned initially in conference with an admissions adviser in the Office of the School of Education and subsequently with a designated adviser in the candidate's area of specialization. They take into consideration the interest of the candidate, the previous background, certification requirements of the state and locality in which he plans to teach.

All degree requirements must be completed within a period of six years after admission to study.

RESIDENCE

Candidates for the degree of Master of Arts in Education must complete satisfactorily at this University, as matriculated candidates in the School of Education, a minimum of 30 semester hours, 9 of which, with the approval of the adviser, may be in the Off-Campus Division of the College of General Studies.

THE THESIS

If a candidate selects the thesis option, the thesis must conform to standards prescribed. A statement of these standards may be obtained at the Office of the Dean.

The thesis subject must be approved in writing by the candidate's adviser and recorded in the Office of the Registrar by the date announced in the University calendar. The thesis in its final form must be presented to the Dean by the candidate no later than the date announced in the University calendar. Printed copies of detailed regulations regarding the form and reproduction of the thesis (see page 36) are available in the Office of the Dean.

Payment of tuition for the thesis will entitle the candidate, during the academic year of registration, to the advice and direction of the member of the Faculty under whom the thesis is to be written. In case a thesis is unfinished, an additional successive academic year may be granted without further tuition payment. The student must, however, be registered in residence during this period. If the preparation of the thesis extends beyond the two-year period it must be registered for again and tuition paid on the same basis as for a repeated course.

COMPREHENSIVE EXAMINATION

In addition to the course examinations, the candidate must pass a comprehensive examination in two parts: (1) a general three-hour examination concerned with an integrated understanding of the foundations of professional education, and (2) a special three-hour examination concerned with the candidate's area of specialization.

THE ADVANCED PROFESSIONAL CERTIFICATE

This program is designed to prepare teachers for more effective service in their chosen fields and to enable them to qualify for a higher step in the local salary scale.

The program of studies leading to the Certificate is selected by the candidate and his adviser from the various related departments of the University in accordance with the student's needs. In general it includes 30 hours of graduate credit beyond the Master's degree. The candidate wishing to increase his teaching proficiency may include additional study in his teaching field.

ADMISSION TO CANDIDACY

The requirements for admission to candidacy for the Advanced Professional Certificate are (1) the degree of Bachelor of Arts in Education or Bachelor of Science in Physical Education from this University, or the equivalent from another institution of higher learning; (2) a Master's degree from an accredited institution of higher learning; (3) at least two years of successful teaching experience; and (4) a permanent teaching license. The applicant who is unable to meet the admission requirements may be admitted with deficiencies to be met by satisfactorily completing prerequisites in addition to the specified program of graduate study. Each applicant must be interviewed by a member of the Faculty of the School of Education.

ADVANCED STANDING AND TRANSFER OF CREDIT

Advanced standing is granted for appropriate graduate work completed in other accredited higher institutions. However, a minimum of 18 semester hours must be completed at this University as a matriculated candidate in the School of Education. The candidate is encouraged to include in his program study at other accredited

higher institutions when such study seems to be in his best interest. Advanced standing is not granted for work completed three or more years before application for admission or readmission.

REQUIREMENTS FOR THE CERTIFICATE

PLANS OF STUDY

In planning his program the candidate should give first consideration to his particular needs. If he is a teacher and his study for the Master's degree was largely in professional education, he may need courses in his teaching field. If his Master's preparation was in a content field, he may need professional study.

The program must include, in addition to any prerequisites, a minimum of 30 hours of graduate credit, 24 hours of which must be in third-group courses (or the equivalent at other institutions). A maximum of 6 semester hours of graduate credit in second-group courses may be included, a minimum of 12 hours in courses offered by the School of Education must be included.

RESIDENCE

Candidates for the Advanced Professional Certificate must complete satisfactorily at this University a minimum of 18 semester hours in courses offered on the campus. The balance of the program may include courses in the Off-Campus Division of the College of General Studies or in other approved institutions of higher learning. The candidate is not required to pursue his program of study continuously. On request, a leave of absence is granted for a period not to exceed three years.

THE DEGREE OF DOCTOR OF EDUCATION

The School of Education offers programs of advanced study leading to the degree of Doctor of Education. These programs are under the supervision of the Committee on Graduate Studies and provide opportunities for study leading to the following professional objectives: school superintendent, secondary school principal, elementary school principal, supervisor, director of guidance, director of curriculum development, professor of education, and specialist in educational research, employee training, or adult education. All programs require study of interrelated areas of education as well as a doctoral dissertation in the major field of study.

Each program is divided into two parts. The first consists of preparation for and the passing of comprehensive examinations in each of four supporting fields and a major field of study. The second is composed of research investigation and the writing of a dissertation in the major field of interest and culminates in the final oral examination.

ADMISSION

The applicant must possess adequate preparation for advanced study including graduate work in fields prerequisite to his objective equivalent to that required for the degree of Master of Arts in Education at this University, at least three years of successful pertinent educational experience, acceptable personal qualities, and a capacity for creative scholarship and effective leadership.

The applicant first arranges for a preliminary interview with the Assistant Dean for Advanced Graduate Studies to explore his needs in relation to the resources of the School of Education and to provide the guidance needed to proceed with an application for advanced study.

To be admitted to graduate study for the degree, the applicant must be accepted by the Committee on Graduate Studies on the basis of the following factors: (1) his previous scholastic and professional record, (2) the results of prescribed admission tests including the Aptitude Test of the Graduate Record Examination, (3) individual evaluation through personal conferences with at least three faculty members including the major professor under whom the applicant desires to pursue his work, and (4) the outcome of a group interview with the Committee on Graduate Studies.

COMMITTEE ON GRADUATE STUDIES

The responsibility for selection of supporting and major fields rests with the candidate. Each applicant when he appears before the Committee on Graduate Studies should be prepared to present an outline of his plan of study including the selection of major and supporting fields and the tools of investigation needed for the completion of a doctoral dissertation. The tools may include one foreign language or more, statistical methods, or historical criticism. Candidates with less preparation than that normally required for a Bachelor's and Master's degree in Education must make up their deficiencies either prerequisite to or as part of their graduate work.

STUDY FOR THE MAJOR AND SUPPORTING FIELD EXAMINATIONS

The requirements for the degree of Doctor of Education cannot be stated in semester hours, but they consist in general of at least two to three years of full-time work, or the equivalent of part-time work, beyond the degree of Master of Arts in Education. Upon admission to study for the first part of a doctoral program the applicant is assigned to a Committee which prescribes and directs his studies. The Committee is composed of professors who will direct the student's work in the major and four supporting fields. Preparation for and the passing of supporting field examinations precedes preparation for and taking the final examination in the major field.

A student is required to consult individually with supporting and major field professors in order to determine the requirements for each field of study and to receive guidance in preparation for each examination. Supporting field examinations are written and are six hours in length. The major field examination is twelve hours in length, six hours on each of two successive days. Upon satisfactory completion of all supporting and major field examinations the student, upon recommendation of the Committee on Graduate Studies, is permitted to pursue the second part of his doctoral program.

THE DISSERTATION AND THE FINAL EXAMINATION

The student permitted to continue the second part of a doctoral program is assigned to a Master in Research, generally the major field adviser. Throughout the remainder of the program, the candidate is responsible solely to his Master in Research. Two additional faculty members assist the Master in reading the first draft of the candidate's dissertation. When the dissertation is considered acceptable, the Master recommends the candidate to the Dean for the final oral examination.

The final oral examination must be passed at least three weeks before the degree is to be conferred. The examination is conducted by a committee of the Faculty appointed by the Dean, supplemented by at least two leaders in the candidate's field of study from outside the University. The examination is open to the public. Candidates who successfully pass the oral examination are recommended for the degree by the Faculty of the School of Education.

RESIDENCE AND CONTINUOUS STUDY

All the preparation for the degree must be done in residence. The student must maintain continuous registration in the School of Education, except when the Committee on Graduate Studies has granted a leave of absence. Failure to maintain registration in each semester of the academic year may result in lapse of candidacy. Subsequent readmission is subject to whatever new conditions and regulations have been established by the Committee on Graduate Studies.

There is no formal regulation concerning the minimum amount of time to be spent in preparation for the minor and supporting field examinations or as a candidate engaged in doctoral research. The supporting and major field examinations, however, must be completed within five years of the date of admission and the entire program must be completed within eight years, regardless of full-time or part-time study. Each candidate is required to complete one semester or more of his program in full-time study. Full-time study in two nine-week Summer Sessions is equivalent to full-time study for one semester.

READING CLINIC

To help children and adults with reading difficulties the University operates a diagnostic and corrective reading clinic. Children may be referred by principals, teachers, or parents. Adults may apply by telephone.

To arrange for a clinical examination of reading status, address The George Washington University Reading Clinic, 2018 I Street NW., or telephone FEderal 8-0250, Extension 491, for an appointment. The Clinic is open for appointments Monday through Friday, from 9:00 A.M. to 5:00 P.M.

Fees.—The fee for individual diagnosis is \$35; for individual instruction, \$4.50 a lesson; for semi-individual instruction, \$3.50 a lesson; for instruction in small groups with common reading difficulties, \$2.75 a lesson; for materials, \$4. All fees are payable in advance at the Office of the Cashier.

SPECIAL CURRICULA

The School of Education provides special curricula for liberal arts graduates, housewives, and retired military personnel who wish to prepare for teaching. It also provides a wide range of courses of interest to (1) emergency teachers who wish to qualify for teaching certificates and (2) teachers who wish to renew licenses.

REGULATIONS

ADMISSION

An applicant for admission must obtain from the Office of the Director of Admissions an application blank which he must fill out completely and return with the application fee of \$10 if applying as a degree candidate, \$5 if applying as a non-degree candidate.

A recent photograph with signature of the applicant must accompany the blank.

Applications should be filed by July 1 for the fall semester, January 1 for the spring semester, and May 1 for the Summer Sessions. However, to insure consideration for admission, applicants for undergraduate degrees and for Master's degrees

(in all but exceptional cases) *must* file completed applications in the Office of the Director of Admissions no later than Wednesday, September 6, for the fall semester; Tuesday, January 17, for the spring semester; and Monday, June 5, for the Summer Sessions. Applications for nondegree status must be filed by 5:00 P.M. on the day before the registration dates as printed in the University calendar.

ENTRANCE REQUIREMENTS

For the Bachelor's Degrees

Bachelor of Arts in Education or Bachelor of Science in Physical Education.—The satisfactory completion of the two-year curriculum in Education or Physical Education offered in Columbian College of Arts and Sciences (see pages 8, 10, 11-12), or the equivalent from another accredited higher institution, or a certificate of graduation from an approved normal school or the equivalent is required. The applicant must have a quality-point index of 2.00 (average grade of C) counting *Incomplete* grades as F. He must have demonstrated a genuine interest in teaching, possess personality traits that give promise of success as a teacher.

Applicants in the Metropolitan Washington Area must have a personal conference with the Assistant Dean of the School of Education in charge of admission or with one of his assistants. Applicants from a distance who are strongly recommended as good teacher prospects by a member of the Faculty of another institution may be admitted without a personal conference.

Applicants who have not completed requirements in the appropriate pre-Education curriculum in Columbian College of Arts and Sciences, or the equivalent at other accredited institutions, may be admitted to the School of Education with deficiencies. Such deficiencies must be removed before graduation and in the sequence prescribed by the student's adviser.

ADVANCED STANDING

An applicant for advanced standing may be considered for admission upon presentation of satisfactory credentials from an accredited institution of higher learning. The student must be in good standing as to scholarship and conduct and must be eligible to return to the previously attended institution in the semester for which he seeks admission to this University. Credit for transferred work will be assigned by the School of Education to the extent that it meets the requirements for the degree sought at this University and subject to the University regulations concerning satisfactory subsequent work.

The applicant who is unable to meet the admission requirements may be admitted with deficiencies to be met by satisfactorily completing prerequisites in addition to the specified program of graduate study. Each applicant must be interviewed by a member of the Faculty of the School of Education. The applicant seeking to qualify for a higher level in the local salary scale must have his program approved by the appropriate representative of the school system employing him.

READMISSION

A student who has previously registered in the University, but who did not attend during the semester prior to registration (summer session excluded) should file an application for readmission two weeks in advance of registration. If the student

applies as a degree candidate and was previously registered as a nondegree student, or if he has attended one or more higher institutions during his absence from the University, he must have complete official transcripts sent to the office of the Director of Admissions from each institution attended before his application will be considered. Applications for readmission are considered on the basis of regulations currently effective.

REGISTRATION

A student cannot register for classes until he has received a letter of admission to the University, issued by the Office of the Director of Admissions.

A student who has previously matriculated in the University, but who has not been in attendance during the semester prior to registration (summer session excluded) should file an application for readmission in the Office of the Director of Admissions two weeks in advance of registration.

No registration is accepted for less than a semester or one summer session.

A student may not register concurrently in The George Washington University and another institution without the permission of the dean of the college, school, or division in which he is registered in The George Washington University. Registration in more than one college, school, or division of the University requires the written permission of the deans concerned, *prior to registration*. Allowance of credit for work done concurrently will be at the discretion of the appropriate Committee on Admission and Advanced Standing.

FEES AND FINANCIAL REGULATIONS

By authorization of the Board of Trustees, the following fees have been adopted:

TUITION FEES

Except work taken by a candidate for a Doctor's degree:

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|---|----------|
| Full-time program (15 hours or more), a semester..... | \$450.00 |
| Part-time program, for each semester hour..... | 30.00 |

For the degree of Doctor of Education:

| | |
|---|----------|
| For work* leading to and including the general examination..... | 1,000.00 |
| For work leading to and including the final examination..... | 1,000.00 |

ADDITIONAL COURSE FEES

In certain courses additional fees, such as laboratory and material fees, are charged as indicated in the course descriptions. These fees are charged by the semester and, unless otherwise indicated, may be defrayed in three payments when the tuition is paid in this manner. Breakage of apparatus is charged against the individual student. When breakage is in excess of the normal amount provided for in the laboratory fee the individual student will be required to pay such additional charges as are determined by the department concerned.

GRADUATION FEES

| | |
|--|-------|
| Wherein a degree is conferred..... | 25.00 |
| Wherein an Advanced Professional Certificate is conferred..... | 25.00 |

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|--------------------------------------|------|
| FEE FOR BINDING MASTER'S THESIS..... | 6.00 |
|--------------------------------------|------|

| | |
|--|-------|
| FEE FOR PRINTING SUMMARY OF DOCTORAL DISSERTATION..... | 85.00 |
|--|-------|

SPECIAL FEES

| | |
|---|-------|
| Application fee, charged each applicant for admission as a degree candidate, nonrefundable | 10.00 |
| Application fee, charged each applicant for admission as a nondegree candidate, nonrefundable | 5.00 |

* This fee does not cover the cost of tuition for elementary courses (numbered 1-100).

| | |
|--|------------|
| Application for Transfer fee, charged* each applicant for transfer within the University from one college, school, or division to another, except in cases of normal progression, nonrefundable..... | 5.00 |
| Admission tests (when required)..... | 6.00-12.00 |
| Late-registration fee, charged each student who fails to register within the designated period | 5.00 |
| Change fee, charged each student for each change in program involving one or more than one course..... | 2.00 |
| Service fee, charged each student for late payment of tuition (see "Payment of Fees") | 2.00 |
| Reinstatement fee, charged each student who is reinstated after suspension for delinquency in fees..... | 5.00 |
| Residence fee, charged each student wishing to maintain "in residence" status during any semester of absence from the University or after completion of tuition requirements..... | 30.00 |
| For special physical examination..... | 2.00 |
| For each examination to qualify for advanced standing and for each special examination | 5.00 |
| Laboratory checkout fee, charged each student in chemistry courses who fails to check out of the laboratory by the time set by the instructor..... | 3.00 |
| Transcript fee, charged for each transcript of record after the first..... | 1.00 |

Registration in the University entitles each student to the following University privileges: (1) the issuance of one certified transcript of record, if and when desired; (2) the services of the Placement Office; (3) the use of University library; (4) gymnasium privileges; (5) admission to all athletic contests, unless otherwise specified; (6) subscription to the *University Hatchet*, the student newspaper; (7) admission to University debates; (8) medical attention and hospital services as described on page 40. These privileges, with the exception of the issuance of transcripts, terminate, and a student is no longer in residence, when he withdraws or is dismissed from the University.

PAYMENT OF FEES

All fees are payable at the Office of the Cashier, 725 Twenty-first Street NW. No student is permitted to complete registration or to attend classes until all fees are paid. Fees for each semester are due and payable in advance at the time of registration.

In exceptional cases, subject to the approval of the Treasurer, the student may sign a contract for semester charges, except for fees payable in advance, permitting payments as follows:

Fall Semester.—One-third at the time of registration; one-third on the first working day† in November; one-third on the first working day† in December.

Spring Semester.—One-third at the time of registration; one-third on the first working day† in March; one-third on the first working day† in April.

Arrangements for the above may be made with the Office of the Cashier at the time of registration.

A student who fails to meet payments when due, but who pays his fees within the following two weeks of the date on which payment is due, is charged a service fee of \$2. A student who fails to meet payments within these two weeks after payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued fees and a reinstatement fee of \$5.

A student suspended for failure to meet payments when due may not be reinstated

* Payable at the time of application for transfer or readmission.

† The University work week is Monday through Friday, inclusive.

for the semester after two weeks from the date of suspension. Applications for reinstatement are to be made to the Office of the Cashier.

An auditor pays all fees chargeable to the student registered for credit except the late-registration fee.

WITHDRAWALS AND REFUNDS

FALL SEMESTER

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in October or November, cancellation of two-thirds or one-third, respectively, of tuition charges.

SPRING SEMESTER

Full-time program.—Complete withdrawal from the University dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the full-time program charges.

Partial withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of the difference between the charges for the full-time program and the hourly charges of the part-time program continuing in effect.

Part-time program.—Withdrawal dated on or before the last working day* in February or March, cancellation of two-thirds or one-third, respectively, of tuition charges.

No refund or reduction will be allowed on any withdrawal dated after the last working day* in November (fall semester) or March (spring semester).

A student enrolled in a full-time program, who drops or adds a course and continues to be in a full-time program, will have no financial adjustments of tuition made other than those involving course fees.

In no case will a refund be made of the first third of the total tuition charges unless the registration is in advance and is cancelled before the regular registration day. In this case a withdrawal fee of \$5 is charged and tuition fees refunded. In no case will tuition be reduced or refunded because of nonattendance upon classes.

Payment applies only to the semester for which a registration charge is incurred and in no case will this payment be credited to another semester.

Any student in chemistry or pharmacy who fails to check out of the laboratory on or before the date set by the instructor, unless excused by the instructor, will be charged a checkout fee in the amount of \$3. A student who drops a course before the end of the semester must check out of the laboratory at the next regular laboratory period.

Any student enrolled in the Air Force ROTC who fails to turn in uniforms, equip-

* The University work week is Monday through Friday, inclusive.

ment, and textbooks, on separation from the Corps, will be charged the value of the missing items.

Authorization to withdraw and certification for work done will not be given a student who has not a clear financial record.

Students are encouraged to provide their own cash funds until they can make banking arrangements in the community.

AMOUNT OF WORK

Fifteen to 17 semester hours of credit constitute a normal program. A student with a quality-point index of 3.00 or higher, may, with the permission of the Dean, enroll for 18 or 19 hours. No student may enroll for more than 19, except by permission of the Committee on Scholarship.

A student employed 15 hours or less a week may carry a normal program of college work.

A student employed from 16 to 25 hours a week may enroll for 12 or 13 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 15 or 16 hours.

A student employed from 26 to 34 hours a week may enroll for 9 or 10 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 12 or 13 hours.

A student employed 35 hours or more a week may enroll for 6 or 7 hours. Such a student with a quality-point index of 3.00 or higher may, with special permission of the Dean, enroll for 9 or 10 hours.

A student who increases his hours of employment after registration or at any time during a semester must report immediately to the Dean so that his program may be adjusted, if necessary.

ATTENDANCE

A student may not attend classes until registration is completed and fees due are paid. Regular attendance is required. A student may be dropped from any course for undue absence.

PROBATION

A student who fails to maintain a quality-point index of at least 2.00 is placed on probation. He remains on probation as long as his index is below 2.00, or until his probation is removed by the Committee on Scholarship.

SUSPENSION

A student on probation who fails to raise his index to 2.00 within the time specified may be suspended. A student who fails one-half or more of the minimum of 16 semester hours may be suspended.

A student suspended for poor scholarship may, within ten days, appeal his case to the Committee on Scholarship through the Dean. If the case appears to be remediable and the student seems likely to improve in his scholarship, the Committee may readmit him on probation. A student denied readmission may again, after the lapse of a calendar year, petition the Committee through the Dean for readmission. A student suspended twice will not be readmitted.

WITHDRAWAL

Withdrawal from a course or from the University, without academic or financial penalty, requires the permission of the Dean. Permission to withdraw from the

University will not be granted a student who does not have a clear financial record.

Withdrawal between the last working day* in October and the end of the fall semester and between the last working day* in February and the end of the spring semester is permitted only in exceptional cases.

All charges for courses dropped without the approval of the Dean must be met by the student. Reporting the dropping of a course to an instructor does not effect its discontinuance.

CHANGES IN PROGRAM OF STUDIES

Changes within the School.—A student may not change or drop courses (see "withdrawals", above) or change his status to that of auditor except with the approval of the Dean, upon presentation of adequate reasons for such changes.

Change from one section to another of the same course may be made with the approval of the Dean and the department concerned.

Change from one major subject to another within the same college or school may be made with the approval of the Dean. All requirements of the course of study to which the change is made must be met.

Transfer within the University.—Transfer from one college, school, or division to another may be made only with the approval of the deans concerned. Application for transfer must be made to the Director of Admissions on the form provided by his office.

Students wishing to transfer from the Division of University Students to the School of Education should note that a maximum of 45 semester hours will be accepted in transfer.

In order to provide degree candidates with proper academic counsel and the benefits of integrated programs of study, the faculties of the various colleges and schools have established minimum residence requirements and regulations with regard to supervision of the work done in the student's major field. In addition, various special regulations regarding course sequence, selection of electives, and advisory approval of programs apply in particular curricula. Students transferring within the University are advised to study carefully the graduation requirements and to note that in all undergraduate divisions 30 semester hours including at least 12 semester hours in the major field, must be completed in residence in the school or college from which the degree is sought. Upon transfer the student should consult the dean concerned and understand clearly the requirements he must fulfill.

SUMMER SCHOOL CREDIT

A student who plans to attend summer school sessions at another institution with the intention of having credits so obtained apply toward graduation from this University must first secure the written approval of the Dean. In no event will such credits be recognized to an amount in excess of that which might be earned in a similar period in this institution.

GRADUATION REQUIREMENTS

To be recommended for graduation a student must have met the admission requirements of the college or school in which he is registered, completed satisfactorily the scholarship, curriculum, residence, and other requirements for the degree for which he is registered, and be free from all indebtedness to the University.

* The University work week is Monday through Friday, inclusive.

Application for Graduation.—It is the student's responsibility to file an application for graduation in the Office of the Registrar at the time of registration for the last semester of the senior or final year.

Scholarship.—The undergraduate student must maintain a quality-point index of at least 2.00.

Candidates for the Master's degree and the Advanced Professional Certificate must obtain at least a grade of *Satisfactory* (B level) on each course of the required minimum graduate program and must maintain a quality-point index of at least 2.50 on all prerequisite courses.

Curriculum.—Curriculum requirements for the Bachelor's degrees are stated on pages 8-24; for the Master's degree, on pages 25-26.

Residence.—The undergraduate student and the Master's candidate must complete a minimum of one year or 30 semester hours in residence. Not more than 9 hours of this requirement may be satisfied by off-campus courses. Summer work may be counted in residence, but in no case may the period of residence aggregate less than thirty weeks. Unless special permission is granted by the Dean to pursue work elsewhere, the work of the senior or final year must be completed in residence.

Candidates for the Advanced Professional Certificate must meet a minimum residence requirement of 18 semester hours taken on campus.

Degree candidates are expected to maintain continuous residence by registering for at least one course in each of two of the three terms (fall, spring, summer). Candidates who are unable to enroll for a course but wish to use the library facilities and consult staff members may, with the permission of the Dean, register "in residence" by paying the residence fee. Candidates, who for reasons beyond their control, must temporarily discontinue their studies may be granted leave of absence for one or two terms, on petition to the Dean's Council.

National Teacher Examinations.—All candidates for the Bachelor of Arts degree in the School of Education are required to take the National Teacher Examinations at one of the three regularly scheduled administrations conducted in February, July, and October. Candidates expecting to graduate in June should take the examinations the previous February. Those expecting to graduate in October should take the examinations the previous July. Those expecting to graduate in February should take the examinations the previous October.

Students will receive individual reports of test scores and may avail themselves of the regular transcript services of the Educational Testing Service. A copy of test scores must be forwarded to the School of Education.

Each senior required to take the National Teacher Examinations must register for them in the office of the Dean at least thirty days prior to the date of the administration of the examinations. Details concerning time, place, registration, and fees may be obtained in the Office of the School of Education.

Thesis or Dissertation.—A thesis or dissertation submitted in partial satisfaction of requirements for the Master's or Doctor of Education degrees must be presented in its final form to the Dean no later than the date specified in the Calendar. Three complete copies of each are required. It is the responsibility of the candidate for a graduate degree to obtain from the Dean a printed copy of the regulations governing the styling and reproduction of the thesis or dissertation, which are rigidly enforced.

Accepted theses and dissertations, with accompanying drawings, become the property of the University and are deposited in the University Library, where the duplicate copies are bound and made available for circulation. Permission to publish or adapt material in them must be secured from the appropriate Dean.

Attendance and Conduct.—The University reserves the right to refuse to confer a degree upon a candidate whose attendance or conduct has been unsatisfactory.

Presence at Graduation.—A candidate is required to be present at the graduation exercises unless written application for graduation *in absentia* is approved by the Dean.

HONORS

With distinction.—In all undergraduate divisions of the University the degree may be conferred "with distinction", at the discretion of the Faculty, if a student attains a quality-point index of 3.50 or higher on all work taken at this institution. To be eligible for this honor a student must have completed at this institution at least one-half of the work required for the degree.

Special honors.—Special honors may be awarded by the Faculty to any member of the graduating class for outstanding achievement in the student's major field of work on recommendation of the major department, under the following regulations:

1. The student must have his candidacy for special honors approved by the faculty member representing the major department or field not later than the beginning of the senior year.

2. The student must meet such other conditions as may be set at the time his candidacy is approved.

3. No student will be awarded special honors unless he has a quality-point index of at least 3.00 on all work taken at this institution.

4. To be eligible for honors a student must have completed at this institution at least one-half of the work required for the degree.

THE LIBRARY

A student registered in the University is entitled to the reference use of the University Library. The Student Identification Card, issued upon the payment of fees, must be presented as identification.

Library books, with the exception of those in the Law and Medical collections, may be drawn for home use for a period of two weeks. Any book which does circulate is subject to recall by the Librarian at any time. Reserve books and periodicals for collateral reading must be used in the reading rooms when the Library is open. With special permission they may be drawn for overnight use when the Library closes. A fine of twenty-five cents will be charged for the first hour or fraction of an hour and five cents for each hour or fraction thereafter that a reserve book is overdue. Grades of a student will be withheld until his library record is clear.

HOURS

The University Library is open from 9:00 A.M. to 10:00 P.M. each class day (Saturday 9:00 A.M. to 5:00 P.M.), and from 2:00 to 6:00 P.M. on Sunday.

RIGHT TO DISMISS STUDENTS

The right is reserved by the University to dismiss or exclude any student from the University, or from any class or classes, whenever, in the interest of the student or the University, the University Administration deems it advisable to do so.

RIGHT TO CHANGE RULES

The University and its various colleges, schools, and divisions reserve the right to modify or change requirements, rules, and fees. Such regulations shall go into force whenever the proper authorities may determine.

PROPERTY RESPONSIBILITY

The University is not responsible for the loss of personal property in any University building. A "Lost and Found" Office is maintained in the Student Union.

FELLOWSHIPS, SCHOLARSHIPS, PRIZES, FINANCIAL AID

University Teaching Fellowships.—These are assigned for the academic year to the various departments of instruction. The applicant is expected to be a prospective candidate for a Doctoral degree in the general field of his future doctoral study. Each teaching fellow receives an annual stipend (on a nine-month basis) of up to \$1,700 plus full tuition and laboratory fees for whatever schedule of study or research his fellowship duties permit him to carry. Stipends vary with the work load of the individual teaching fellow. Normally a University teaching fellow renders half-time service in classroom or laboratory assignments to the department of instruction directing his doctoral study. Application should be made to the executive officer of the department of instruction concerned.

Graduate Teaching Assistantships.—These are open in various departments of instruction to candidates for the Master's degrees. Each graduate teaching assistant renders a designated unit of service to his major department of instruction, and receives, depending upon his teaching or laboratory assignment, up to \$1,700 on a nine-month basis plus tuition and laboratory fees for the program of studies which the duties of his assistantship permit him to carry. Application should be made to the executive officer of the department of instruction concerned.

Emma K. Carr Scholarship.—Four scholarships in the amount of \$400 each and ten of \$100 each, established in 1932 by Mrs. Emma K. Carr, are available to "young men (of the white race) for undergraduate or postgraduate work, considering character, capacity, and need".

Mildred Green Memorial Scholarship Fund.—The income from this fund, established in 1959 by Alpha Theta Chapter of Pi Lambda Theta, is awarded annually to a student in the School of Education, upon the recommendation of the donor, which is submitted prior to April 1.

Anna Spicker Hampel Scholarship.—Established in 1949 by Mrs. Evelyn Hampel Young in memory of her mother, Anna Spicker Hampel, and available for scholarship aid to young married women students in the School of Education or Columbian College of Arts and Sciences.

Elizabeth V. Brown Scholarship Fund.—A Columbian Women Scholarship fund created in 1925 by the College Women's Club of Washington, D. C., in memory of Elizabeth V. Brown.

Phi Delta Kappa Prize.—Established in 1956 by Beta Gamma Chapter of Phi Delta Kappa, consists of a United States Government Savings Bond and is presented annually to the outstanding senior man in the teacher education program in the School of Education.

Pi Lambda Theta Prize.—Established in 1956 by Alpha Theta Chapter of Pi Lambda Theta, consists of a United States Government Savings Bond and is presented annually to the outstanding senior woman in the teacher education program in the School of Education.

University Loan Fund.—The Trustees of The George Washington University have

made available a fund for short-term loans to students to provide for partial payment of tuition. Applications for these loans shall be made three days prior to the dates on which tuition installments are due.

Home Economics Loan Fund.—Contributed by the D. C. Home Economics Association and available for loans to senior girls majoring in Home Economics.

National Defense Student Loan Fund.—This fund is available to full-time undergraduate and graduate students who are in need of financial assistance. Priority is given those applicants who express a desire to teach in elementary or secondary schools, and whose academic background indicates a superior capacity or preparation in science, mathematics, engineering, or a modern foreign language. After application for admission to the University has been completed, application on forms prescribed for this loan fund must be filed in the Office of the Treasurer no later than August first for the fall semester, December first for the spring semester, and May first for the Summer Sessions.

For complete information on other Fellowships, Scholarships, Prizes, Financial Aid, request the Special Bulletin on the subject, which is available in the Office of the Committee on Scholarships, The George Washington University, Washington 6, D. C.

A list of banks and commercial finance firms offering various types of tuition payment plans is available through the Office of the Treasurer.

STUDENT LIFE

LIVING ACCOMMODATIONS

The University maintains five residence halls. Meals are served at the Student Union.

Admission to the University does not include room reservation. A separate application for a room should be made well in advance. Forms for application, together with detailed information, may be obtained from the Director of Activities for Women or the Director of Activities for Men.

Information concerning private rooming and boarding facilities near the University, for women students twenty-one years of age or older and for men students, may be obtained at the Housing Office, Lisner Auditorium. The reservation of rooms in private houses must be made by students.

Girls under the age of twenty-one who are enrolled for twelve or more semester hours of academic work in the University and who are not living with their parents or relatives may live outside the dormitories only with the permission and approval of the Director of Activities for Women, upon receipt of written requests from parents. In no case will permission be granted for such girls to be domiciled outside the dormitories except with persons approved by the Director of Activities for Women.

Women Students.—The Hattie M. Strong Hall provides single rooms at \$47.50 a month and double rooms at \$40 a month a person.

Dolly Madison Hall provides double rooms at \$40 a month a person.

Hancock Hall provides single rooms at \$52.50 a month and double rooms at \$40 a month a person.

Men Students.—Welling Hall provides double rooms at \$30 a month a person. John Quincy Adams Hall provides 69 double rooms each with study alcove and bath. Rooms rent at \$40 a month a person.

Dormitory payments are due and payable in advance on the first day of each month. A student who fails to meet payments when due, but who makes his payment from the tenth to the fifteenth, inclusive, of the month in which payment is due, is charged a service fee of \$2. A student who fails to meet payments by the fifteenth of the month in which payment is due will be automatically suspended and may not attend classes until he has been officially reinstated and has paid all accrued rent and a reinstatement fee of \$5.

HEALTH ADMINISTRATION

The University maintains a health service that is primarily diagnostic in its intent. For medical emergencies and health consultations there is, on the Campus, a Student Health Clinic open from 9:00 A.M. to 5:00 P.M. with physician and nurse in attendance. There is also a rest room for women, with a graduate nurse in charge.

Medical privileges include: (1) physical examination of every student entering from secondary school;* (2) three visits by the University physician or surgeon, office or residence (District of Columbia), in any one illness, exclusive of a specialist, surgical operation, laboratory, or X-ray examination; (3) hospitalization, including board and nursing, in the University Hospital for not more than one week during any twelve-month period—the necessity to be determined by the Director of Health Administration.† All additional hospital charges for operating room, laboratory, anesthetics, X-ray, medications, or any other special service must be paid by the student. The duration of hospitalization period (maximum, one week) is also to be determined by the Director of Health Administration.

This medical benefit applies only to illness or disability incurred while currently enrolled in the University. It does not apply to illness or disability incurred between the last day of examinations for a semester or summer session and completion of registration for the next semester or summer session.

The student is allowed, if he so desires, to engage physicians and nurses of his own choice, but when he does so he will be responsible for the fees charged.

Rules: (1) The Director of Health Administration is empowered to limit or deny the medical benefits where, in his discretion, a student has, by his misconduct or breach of the rules of the University, made himself ineligible; (2) the Director of Health Administration has authority to determine the necessity and length of hospitalization; (3) a student not currently enrolled or one who has severed his connection with the University is ineligible for medical benefits; (4) a student intending to train for an athletic team is required to pass a thorough examination at the beginning of each semester; (5) hospitalization is not available to those students availing themselves of other hospitalization coverage for the same illness.

The University is not responsible for injuries received in intercollegiate or intramural games, or in any of the activities of the physical education departments.

HONOR SOCIETIES AND PROFESSIONAL ORGANIZATIONS

Alpha Pi Epsilon.—An honorary Home Economics Sorority whose purposes include the improvement of scholarship and leadership standards among Home Economics students.

* A charge of \$2 for a special physical examination is made by the University if a student fails to appear for a physical examination during the period set for this purpose.
† See Rule (5) for exception.

Phi Delta Kappa.—An international professional fraternity for men in Education, to promote fellowship based on common interests and ideals which make possible group action for the development of free public education through research, service, and leadership.

Pi Lambda Theta.—A national honorary association for women in Education, dedicated to the conception of education as a profession.

Student National Education Association.—Provides members with opportunities for developing personal and professional competency through an understanding of the history, ethics, and programs of the organized teaching profession.

COURSES OF INSTRUCTION

The University reserves the right to withdraw any course announced.

EXPLANATION OF COURSE NUMBERS

First-group courses.—Courses numbered from 1 to 100 are planned for students in the freshman and sophomore years. With the approval of the adviser and the Dean, they may also be taken by juniors and seniors. In certain instances, they may be taken by graduate students to make up undergraduate deficiencies or as prerequisite to advanced courses, but they may not be credited toward a higher degree.

Second-group courses.—Courses numbered from 101 to 200 are planned for students in the junior and senior years. They may be credited toward higher degrees only when registration for graduate credit has been approved before the mid-point of the course by the Dean of the School of Education and by the officer of instruction concerned, and when the completion of additional work has been certified by the officer of instruction.

Third-group courses.—Courses numbered from 201 to 300 are planned primarily for graduate students. They are open, with the approval of the officer of instruction, to qualified seniors.

INDICATION OF THE AMOUNT OF CREDIT

The number of semester hours of credit given for the satisfactory completion of a course is indicated in parentheses after the name of the course. Thus, a year course giving three hours of credit each semester is marked (3-3), and a semester course giving three hours of credit is marked (3).

DEPARTMENT OF EDUCATION

Courses offered by the Department of Education are of two types: those designed for the preservice education of candidates and those planned for the inservice education of teachers, counselors, and administrators.

Preservice courses devote two or three hours a week to lecture and discussion supplemented by a minimum of two hours a week of related field work. A clinical approach to the study of educational problems is used—lectures and discussions revolving around observed practices.

Inservice courses meet once a week for a two-hour period. Class work is supplemented by extensive reading assignments, the preparation of reports, and field work.

A student enrolled in one of these courses should plan to devote not less than seven hours a week, exclusive of class time, to the work of the course.

Ample opportunity is provided to study teaching or administrative problems of special interest. To enable students to consult with instructors regarding individual problems, a conference hour is scheduled immediately before or after the class period.

Only the courses designed to provide professional information and skills are listed below. For courses needed for general education or teaching-field preparation, see the general catalogue. In addition to courses offered in the Department of Education a number of professional courses for teachers are offered in the departments of Psychology, Speech, and Statistics. These are listed below together with courses offered by the Department of Education.

Whenever possible, the exact hour of class meeting is stated. Hours for classes not yet scheduled may be found in the Schedule of Classes for the semester concerned.

A Reading Clinic

Coleman and Staff

Diagnosis of reading difficulties; individual or group lessons without academic credit. Fee: for individual diagnosis, \$35; for individual instruction, \$4.50 a lesson; for semi-individual instruction, \$3.50 a lesson; for instruction in small groups with common reading difficulties, \$2.75; material fee, \$4.

SECOND GROUP

109-10 *Human Development, Learning, and Teaching* (3-3) Baker and Staff

Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. *First half:* fall—section A: M 1:10-3 P.M., section B: W 6:10-8 P.M.; summer 1961 (McCauley, Baker). *Second half:* fall—F 1:10-3 P.M.; spring—section A: M 1:10-3 P.M., section B: W 6:10-8 P.M.; summer 1961 (McCauley, Lang). For the general student as well as the prospective teacher. *First half:* nature of human growth, development, and learning, illustrated by observation of children in learning situations. *Second half:* nature of teaching based upon principles of human growth, development, and learning, illustrated by observation of school situations.

111 *Methods in Elementary Education* (12)

Baker and Staff

Fall—Monday through Friday 9:10-12 A.M. For seniors in the elementary school curriculum. Methods, materials, appraisal, and field experiences in elementary schools. Problems and procedures in teaching the language arts (including reading, literature for children, oral and written expression, spelling, and handwriting), arithmetic and science, social studies. Planning units of work, general classroom procedures, and evaluation of pupil progress. Observation and participation two mornings a week. Prerequisite: Education 109-10 and 121-22.

112 *Educational Measurement* (3)

Hayes

Fall—T 3:10-5 P.M.; spring—W 7:10-9 P.M.; summer 1961. Scope, needs, services to students, selection and construction of teacher-made tests, interpretation of tests for evidence purposes. Prerequisite: Education 109-10, 121-22.

113 *Elementary School Art* (3)

Nowlin

Fall: lecture and laboratory—M 7:10-10 P.M., field work—as arranged; spring: lecture and laboratory—T 7:10-10 P.M., field work—as arranged; summer 1961 (Crump). For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22. Material fee, \$4.50.

114 *Elementary School Music* (3)

Reed

Fall—Th 7:35-9:35 P.M., field work (2 hours)—as arranged; spring—Th 7:35-9:35 P.M., field work—as arranged; summer 1961. For undergraduates in the elementary school curriculum. Materials and methods. Prerequisite: Psychology 1 and 22.

- 115 Teaching of Reading in the Elementary School*** (3) Huse
 Spring—W 7:10-9:10 P.M., field work (2 hours)—as arranged; summer 1961. A basic course in methods, techniques, materials, and activities essential to a good elementary school reading program. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 116 Elementary School Social Studies*** (3) Huse
 Fall—F 7:10-9:10 P.M., field work (2 hours)—as arranged; summer 1961 (Cushman). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 117 Elementary School Science*** (3) St. Cyr
 Spring—F 6:10-9 P.M., field work (2 hours)—as arranged; summer 1961. For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 120 Elementary School Arithmetic*** (3) Scott
 Spring—Th 7:35-9:35 P.M., field work (2 hours)—as arranged; summer 1961 (Baker). For teachers. Content, methods, materials, and activities essential in the elementary school curriculum. Prerequisite: Education 109-10 and 121-22 or teaching experience.
- 121-22 Society and the School** (3-3) St. Cyr and Staff
 Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. *First half*: fall—section A: W 1:10-3 P.M., section B: M 6:10-8 P.M.; summer 1961 (St. Cyr, Scott). *Second half*: fall—Th 1:10-3 P.M.; spring—section A: W 1:10-3 P.M.; section B: M 6:10-8 P.M.; summer 1961 (Eller, Scott). For the general student as well as the prospective teacher. *First half*: the historical and sociological development of education at local, national, and international levels; cooperation of the school with other community agencies. *Second half*: organization and operation of schools; principles and functions; role of the teacher.
- 128 Children's Literature*** (3) Walker
 Spring—M 7:10-9:10 P.M., field work (2 hours)—as arranged; summer 1961 (Wilson). For teachers. Exploring and evaluating the newer books for children and the children's classics, understanding the contribution of literature in child development, appreciating children's original expressions. Prerequisite: Psychology 1 and 22.
- 131 Common Teaching Skills in Secondary Schools** (3) Detwiler, Myers, Stallings
 Fall—TTh 12:30-1:45 P.M.; spring—MW 4:30-5:45 P.M. For seniors in the secondary school curriculum. Course, unit, and lesson planning; practical techniques used in connection with motivation, the assignment, group procedures, directing study, individual differences, evaluation, clerical routines, disciplines, the homeroom, activity sponsorship, public relations. Prerequisite: Education 109-10 and 121-22.
- 134 Student Teaching in Secondary Schools** (6 to 9) Detwiler, Myers, Stallings
 134A, 134B, 134C, and 134D: spring—as arranged. For seniors in the secondary school curriculum. Sections A and B are for full-time academic majors (Detwiler). Section C is for academic majors in the intensive program (Detwiler). Section D is for physical education majors (Myers, Stallings). Education 134 student teaching fee, \$50. Admission by permission of the instructor. Prerequisite: Education 109-10 and 121-22.
- 135 Student Teaching in Elementary Schools** (9) Baker
 135A and 135B: spring—as arranged. For seniors in the elementary school curriculum. Student-teaching fee, \$50. Admission by permission of the instructor. Prerequisite: Education 109-10 and 121-22.

* This course may not be taken by students who have completed or plan to enroll in Education 111.

SPECIAL METHODS COURSES*

To be elected in the senior year after substantial preparation in the teaching fields concerned by the students in the secondary school curriculum. Course requirements and hours of credit vary with license requirements. Practices of successful teachers are studied and actual teaching content as found in current texts and courses of study is reviewed.

- 136 *Teaching English* (2 to 4) Lumsden
Spring—M 7:10-9 P.M., field work (2 hours)—as arranged. Prerequisite*: 18
semester hours in English.
- 138 *Teaching Social Studies* (2 to 4) Whipple
Spring—T 7:35-9:35 P.M., field work (2 hours)—as arranged. Prerequisite*: 24
semester hours of social studies.
- 140 *Teaching Mathematics* (2 to 4) Snader
Spring—Th 7:35-9:35 P.M., field work (2 hours)—as arranged. Prerequisite*:
Mathematics through calculus.
- 144 *Teaching Science* (2 to 4) Eller
Spring—T 7:35-9:35 P.M., field work (2 hours)—as arranged. Prerequisite*: 24
to 40 semester hours of science.
- 146 *Teaching Foreign Languages* (2 to 4) McSpadden
Spring—T 5:10-7 P.M., field work (2 hours)—as arranged. Prerequisite*: 18
semester hours of one foreign language.
- 150 *Teaching Business Subjects* (2 to 4) Shott
Spring—S 9:10-11 A.M. Prerequisite*: 30 semester hours of business education.

THIRD GROUP†

- 201-2 *Human Development, Learning, and Teaching* (3-3) McCauley
Lecture (2 hours), conference (1 hour), field work (2 hours)—as arranged. Academic year—section A: M 7:10-9:10 P.M., section B: Th 7:35-9:35 P.M. For graduate students. *First half*: nature of learning approached through the study of classroom situations. *Second half*: nature of teaching approached through observation of classroom situations.
- 203-4 *Comparative Education* (3-3) Jacobs
F 7:10-9:10 P.M. Comparison of foreign educational systems with those of the United States; particularly those of Russia, West Germany, Denmark, Switzerland, France, the British Isles, Canada, and Australia.
- 205-6 *The Curriculum*‡ (3-3) St. Cyr
Academic year—Th 7:35-9:35 P.M. For experienced teachers. *First half*: curriculum foundations and issues; comparison of curriculum patterns. *Second half*: principles and procedures in curriculum development; group consideration of student problems.
- 207 *Curriculum Materials*† (3) St. Cyr
Summer 1961. For experienced teachers. Construction of courses of study, resource units, classroom teaching aids, and inexpensive materials; direct application to students' own situations.
- 209 *Child Growth and Development* (3) Scott
Fall—F 7:10-9:10 P.M. An interdisciplinary approach to child development taking into account such factors as society and culture, socialization, and socializing agents with particular emphasis on the home and school.
- 210 *Adolescent Growth and Development* (3)
Spring—F 7:10-9:10 P.M. A consideration of physical, intellectual, and cultural backgrounds of adolescence with particular emphasis on social development, adjustment.

* Prerequisite to all special methods courses: Education 109-10, 121-22, and 131. Additional prerequisites are stated under each course.

† A degree from an accredited institution is prerequisite to all third-group courses.

‡ Prerequisite: adequate professional preparation.

ment to organized society, educational development and adjustment to school, and home relationships.

211 Evaluation in Education* (3)

Not offered 1961-62. Concept of evaluation, relationship between evaluation of ends and means, steps involved in the evaluation of learning outcomes. As the course progresses each student develops solutions for evaluation problems related to his work situation.

212 Educational Measurement (3)

McCauley

Not offered 1961-62. Basic measurement techniques; construction, selection, administration, and interpretation of objective and essay-type examinations; statistical analysis of test results; laboratory experiences in the use of test instruments.

213-14 History of Education (3-3)

Wilson, Jarman

Academic year—T 7:35-9:35 P.M. *First half:* the European backgrounds of American education. *Second half:* the evolution of the American school system.

215 Education of Exceptional Children* (3)

Fall—W 7:10-9:10 P.M. For classroom teachers. A survey of current problems in the education and guidance of exceptional pupils. Nature and needs of those physically, mentally, or emotionally handicapped; needs of the gifted. Resources for help in correction, diagnosis, therapy, education, and guidance.

216 Education of Slow-learning Children* (3)

Spring—W 7:10-9:10 P.M.; summer 1961 (Lyon). Identification, nature, and needs of slow-learning elementary and junior high school children. Emphasis on diagnosis and treatment of learning difficulties.

217-18 Philosophy of Education* (3-3)

Darland, Jarman

Academic year—M 7:10-9:10 P.M.; summer 1961—Education 217 (3) (Darland). *First half:* designed to help students formulate a personal philosophy of education. *Second half:* social foundations of education—a study of the forces that shape the policies and offerings of the school.

219 Elementary School Classroom Procedures* (3)

Baker

Summer 1961. Current classroom practices with particular emphasis on ways of planning, unit teaching, techniques in discipline; individual and group evaluation techniques, resources for learning, providing for individual differences.

221 Early Childhood Education* (3)

Not offered 1961-62. For experienced teachers. Emphasis on methods, materials, and learning experiences designed to meet the developmental needs of kindergarten and primary-grade children.

223-24 Reading Problems* (3-3)

Coleman

Academic year—W 7:10-9:10 P.M. For experienced teachers. Study of reading difficulties on elementary and secondary school levels; classroom and clinical procedures in solving reading problems.

225 Elementary School Reading (3)

Coleman

Summer 1961. For experienced teachers. Developmental and remedial approaches to reading problems. Demonstration of diagnostic and corrective techniques used by the classroom teacher and the reading specialist.

227 Basic Issues in Elementary Education (3)

Baker

Fall—T 7:35-9:35 P.M. A consideration of basic issues in the purposes, organization, and conduct of elementary education. Emphasis on the philosophical and psychological roots of fundamental assumptions as they relate to classroom practices.

* Prerequisite: adequate professional preparation.

- 228 *Instructional Areas in Elementary Education* (3) Baker
Spring—T 7:35–9:35 P.M. Critical appraisal of the objectives, organization, content, and teaching methods in the language arts, arithmetic, social studies, science, arts and crafts, health and physical education.
- 229 *Administration of Elementary Education* (3)
Fall—F 7:10–9:10 P.M.; summer 1961 (Tyler). For experienced teachers and administrators. Administration as a means of achieving instructional objectives, organizing learning and teaching activities, handling supplies and equipment, maintaining the building, and integrating school and community life. Emphasis upon guide lines to action.
- 231 *Secondary School Classroom Procedures** (3) Giancaspro
Fall—Th 7:35–9:35 P.M.; summer 1961. Survey of current classroom practices with particular attention to selected topics such as teacher-pupil planning, group procedures, pupil security, initiatory and culminating activities, individual and group evaluation techniques, teaching aids, etc.; review of recent literature.
- 233 *Audio-visual Education** (3) Logan,
Spring: lectures (2 hours), laboratory (1 hour)—F 6:30–9:30 P.M.; summer 1961
Role of audio-visual materials in learning; selection, evaluation, and use of materials; administrative problems in the care, operation, maintenance, and use of audio-visual materials and equipment. Material fee, \$7.
- 234 *Teaching Composition in the Junior and Senior High School* (3) Lumsden
Not offered 1961–62. For experienced teachers of English. Methods and materials for improving writing skills; exploring ways to achieve the goal of a theme a week as recommended in the Conant Report. Particular attention to successful techniques, standards of performance, methods of grading; use of style sheets and literary models; and the relationship of the study of grammar to writing.
- 241 *Education of the Gifted** (3)
Fall—S 11:10 A.M.–1 P.M.; summer 1961. For classroom teachers. Nature and discovery of giftedness; provisions for the gifted in regular classes; experimental projects.
- 243 *Human Relations in the Classroom** (3) Marinaccio
Summer 1961. Principles and practices involved in interpersonal relationships between learner and teacher and among learners.
- 245 *School and Community** (3) Angel
Spring—T 7:35–9:35 P.M.; summer 1961. The school as an important member of a team of social agencies that builds the community.
- 247 *Vocational Education** (3) Walsh
Not offered 1961–62. Development in the United States; current conceptions, agencies involved, problems, and trends.
- 251 *Guidance in Secondary Schools** (3) McDaniels
Fall—M 7:10–9:10 P.M.; summer 1961 (Detwiler). Scope; needs; organization of the program; services to students, the instructional staff, and the administration; personnel needed for the program.
- 252 *Organization and Administration of Guidance Services* (3)
Not offered 1961–62. Designed for guidance directors and supervisors and experienced school counselors who hope to qualify for such positions in the near future. Prerequisite: a minimum of 15 semester hours of approved graduate work in Measurement and Guidance.
- 254 *The Junior High School** (3) Root
Not offered 1961–62. Purposes, organization, core programs, guidance, developing course of study, extra-classroom activities.

* Prerequisite: adequate professional preparation.

255-56 Secondary Education* (3-3)

Root

Academic year—T 7:35-9:35 P.M.; summer 1961 (Root, Giancaspro). *First half:* current proposals for the improvement of secondary education. *Second half:* current problems in each of the subject-matter fields.

259-60 Secondary School Management* (3-3)

Johnson

Academic year—W 5:10-10 P.M. For experienced teachers and administrators with two years of successful teaching in secondary schools. Management planning, execution, and control; criteria of good management, construction of the master schedule; leadership problems incident to the development of new policies and programs.

263-64 Employee Training (3-3)

Root

Academic year—W 7:10-9:10 P.M. *First half:* nature and purpose, review of major programs—orientation, supervisory, apprentice, clerical skills, communication. *Second half:* administrative problems and practices, training media, coordination with other management functions. Prerequisite: adequate professional preparation or two years of experience in employee training.

265-66 Teaching Secondary School English (3-3)Lumsden and
Guest Lecturers

Academic year—W 7:10-9:10 P.M. A refresher course for teachers of English. Discussion of new approaches to high school content. Offered in cooperation with the departments of English and Speech. *First half:* communication skills—structural linguistics, composition, and speech. *Second half:* American and English literature.

267-68 Teaching Secondary School Social Studies (3-3)

Whipple

Not offered 1961-62. A refresher course for teachers of the Social Studies. Discussion of new approaches to high school content. Offered in cooperation with the departments of History, Political Science, Geography, Economics, and Sociology and Anthropology.

270 Art Education (3)

Nowlin

Not offered 1961-62. For experienced teachers. Basic philosophies of contemporary teachers of art; use of visual and tactile media; emphasis upon visual aids, displays, and use of community resources. Designed to increase awareness of the creative process. Prerequisite: Education 113. Material fee, \$4.50.

271 The Teacher and School Administration* (3)

Fox

Fall—S 9:10-11 A.M. A survey course for teachers and prospective administrators. Education and world affairs, national agencies, role of the state, local administration, school finance, legal controls, school plant, public support, democratic administrative procedures, improving teaching conditions.

272 The Teacher and School Supervision* (3)

Fox

Spring—S 9:10-11 A.M.; summer 1961. Nature, organization, human relationships, and techniques.

273-74 Teacher Education* (3-3)

LaBue

Academic year—Th 7:35-9:35 P.M. *First half:* aims, objectives, and basic issues; study of outstanding and experimental programs. *Second half:* recruitment and selection, general education, teaching-field preparation, professional sequences, laboratory experiences.

275 School Finance* (3)

Hutchins

Not offered 1961-62. Educational financial theory, practice, and control, including methods of financing.

276 Seminar: Public Relations in School Administration* (3)

Joy

Summer 1961. Purposes, gathering materials, disseminating agencies, publicity media, public participation in policy making.

* Prerequisite: adequate professional preparation.

- 278 School Law* (3)** Remmlein
Not offered 1961-62. Sources and scope of school law; legal rights and responsibilities of teachers, pupils, and taxpayers. Other legal problems of major interest to the group.
- 279-80 Adult Education* (3-3)** Holden, Detwiler
Fall—M 7:10-9:10 P.M.; Spring—F 7:10-9:10 P.M.; summer 1961—Education 279 (3) (Detwiler). *First half:* current concepts and objectives, agencies involved, programs on all levels—international through community. *Second half:* the adult as a learner, the teacher of adults, learning-teaching activities, administration of adult education programs.
- 281 Group Procedures in Education* (3)** Detwiler
Summer 1961. Theory, practice, evaluation, and application to all educational levels.
- 285 Extra-classroom Activities* (3)**
Not offered 1961-62. Nature and purposes of selected activities—homeroom, clubs, assemblies, school publications, student council, interscholastic contest; particular attention to sponsorship, participation, finance, and evaluation.
- 287-88 Clinical Study of Reading Problems* (3-3)** Coleman
Academic year—F 5:10-7 P.M. For advanced students. Diagnostic and corrective work under supervision of the Reading Clinic. Each student is expected to diagnose and treat pupils who are retarded in reading. Case studies are presented and criticized. Prerequisite: Education 223-24 or the equivalent. Material fee, \$5 a semester.
- 289-90 Supervisory Problems in Reading* (3-3)** Coleman
Not offered 1961-62. For experienced teachers, principals, supervisors, and superintendents. Considers the problems involved in planning, reorganizing, and improving the total reading program, and in promoting cooperative effort on the part of the staff toward increasing teaching efficiency.
- 291 Planning the School Plant (3)**
Fall—T 7:35-9:35 P.M. Selection of sites; evaluation of existing buildings; utilization of present facilities; adaptation to curricular needs; building, operation, and maintenance problems.
- 293-94 Research (3-3)** The Staff
Academic year—as arranged. Individual research under the guidance of a member of the staff. Program and conferences arranged with an instructor.
- 295 Educational Research Methods and Procedures (3)** LaBue
Fall—T 5:10-7 P.M.; spring—M 5:10-7:10 P.M.; summer 1961. Required of all candidates for graduate degrees in Education. To be taken early in the student's graduate program. Prerequisite: an elementary course in statistics.
- 296 Seminar in Educational Research (3)**
Not offered 1961-62. Designed to help students analyze scientific approaches to problems in education; evaluate the application of research techniques to typical problems; define, organize, and conduct research studies; and prepare proposals for sponsored research. Required of all candidates for the Doctor of Education degree and open, with permission, to candidates for other advanced degrees. Prerequisite: Education 295 or the equivalent.
- 297 Reading in Education** The Staff
Fall—W 5:10-6 P.M.; spring—W 5:10-6 P.M.; summer 1961. To assist those preparing for the comprehensive examinations. No credit toward degree requirements. Tuition fee, \$30.
- 299-300 Thesis (3-3)** The Staff
Academic year—as arranged. Required of all Master of Arts candidates writing theses.

* Prerequisite: adequate professional preparation.

DEPARTMENTS OF PHYSICAL EDUCATION

The following courses are offered by the Department of Physical Education for Men and the Department of Physical Education for Women. Whenever possible the departments offer lecture courses jointly.

FIRST GROUP

- 43-44 *Techniques of Physical Education Motor Activities (2-2)* DeAngelis, Krupa
Academic year—morning. Fundamental skills, rules, and organization. Locker and towel fee,* \$4.50 a semester.
- 45-46 *Teaching Individual and Dual Sports in Secondary Schools (2-2)* Hanken, Krupa
Academic year—afternoon. Tennis, golf, swimming, wrestling, badminton, bowling. Locker and towel fee,* \$4.50 a semester.
- 47 *Introduction to Physical Education (2)* Myers
Fall—morning. An orientation course presenting the problems of physical education, vocational analysis, scientific foundations, and scope of field.
- 48 *Introduction to Recreation (2)* Hanken
Spring—as arranged. The role of recreation in modern living; current practices in community recreation work; standards of training, experience, and salary; types of leadership.
- 49 *Human Anatomy (3)* Stallings
Fall—morning. The structure of the human body. Basic course for physical education majors. Also open to both men and women not majoring in Physical Education. Prerequisite: Biology 1-2 or Zoology 1-2.
- 50 *Kinesiology (3)* Lawrence
Spring—morning. A study of the anatomical mechanism of movement, analysis of the action of muscles in physical education activities. Prerequisite: an approved course in anatomy.
- 51-52 *Teaching Physical Education Activities (2-2) (women)* The Staff
Academic year—as arranged. Team sports: basketball, hockey, softball, soccer, speedball. Individual and dual sports: tennis, badminton, archery, swimming and diving, lifesaving and water safety. Gymnastics. Tumbling. Locker and towel fee,* \$4.50 a semester.
- 58 *First Aid and Care of Athletic Injuries (2)* DeAngelis
Spring—morning. Prevention and emergency care of injuries of all types, with special reference to first aid, civil defense, bandaging, and massage. Prerequisite: Biology 1-2 or Zoology 1-2.

SECOND GROUP

- 101 *Physical Education in the Elementary School (3)* Burtner, Snodgrass
Fall—afternoon; spring—evening. Physical growth and development of the child and adolescent. Survey of age characteristics and organization of physical education activities for the various age levels in elementary school, playground, and settlement house programs. Methods and materials of tumbling, games, dance, and self-testing activities.
- 103 *History and Principles of Physical Education (3)* Myers, Stallings
Fall—morning. Survey of history as it relates to contemporary physical education. Study of aims, objectives, and philosophy of physical education.

* The locker and towel fee is required for registration in one or more of the activity courses.

- 105-6 *Adapted Physical Education and Physical Examinations* (3-3) Lawrence
Academic year—morning. Cause and correction of faulty body mechanics, physical examination methods for the diagnosis of postural defects, prescription of exercises, and program adaptation. Prerequisite: Physical Education 49 and 50.
- 107 *Teaching Recreational Dance* (1 to 2) Burtner
Fall—morning. Methods and materials for teaching the country and social dances of America and the folk dances of other countries to secondary-school age and adult groups. Square-dance calling is included. Locker and towel fee,* \$4.50.
- 109-10 *Leadership Organization in the Intramural Program* (2-2) DeAngelis
Academic year—afternoon. Principles of administration, organization, and supervision of intramural activities in the physical education program of the junior high school, senior high school, and college.
- 111-12 *Teaching Physical Education Activities* (2-2) (women) The Staff
1962-63 and alternate years: academic year—afternoon. Continuation of methods and materials in activities listed under Physical Education 51-52. Locker and towel fee,* \$4.50 a semester.
- 113-14 *Practice in Teaching Physical Education Activities* (2 to 4-2 to 4) The Staff
Academic year—as arranged. Principles and methods applied to learning and teaching physical education activities. Supervised laboratory. Locker and towel fee,* \$4.50 a semester.
- 115-16 *Teaching Team Sports in Secondary Schools* (2 to 4-2 to 4) (men) DeAngelis, Hanken
Academic year—morning. Football, basketball, baseball, track and field. Locker and towel fee,* \$4.50 a semester.
- 117 *Teaching Modern Dance* (1 to 2) Burtner
1962-63 and alternate years: fall—afternoon. Techniques for the teaching of movement as a medium of expression. Practical work in body technique, composition, and the analysis of accompaniment for dance including instrumental, voice, and percussion. Application is made to both secondary school and adult age levels. Locker and towel fee,* \$4.50.
- 118 *Dance Production* (1 to 2) Burtner
1962-63 and alternate years: spring—afternoon. Planning and staging of performances for demonstrations, dance concerts, and folk festivals. Lighting, costuming, sets, and make-up. Choreography for concerts, musicals, and plays for students taking course for two credits. Locker and towel fee,* \$4.50.
- 121 *School and Community Health Programs* (3) Krupa
Fall—afternoon. Health services, healthful environment, health instruction, sources of material for general health knowledge. Prerequisite: Biology 1-2 or Zoology 1-2.
- 122 *Methods and Materials for Health Education* (3) Stallings
Spring—evening. Methods and materials for teaching health at each age level. Prerequisite: Biology 1-2 or Zoology 1-2.
- 131 *Tests and Measurements in Physical Education* (3) Krupa
Fall—morning. Critical survey of tests in physical activities, methods of test construction, elementary statistics.

* The locker and towel fee is required for registration in one or more of the activity courses.

- 132 Camp Leadership (1 to 2)** Stallings
Spring—afternoon. Philosophy and techniques of camp counseling; survey of organization and programs including outdoor education. Also open to both men and women not majoring in Physical Education.
- 136 Survey of Dance History and Dance Forms (3)** Burtner
1961-62 and alternate years: spring—as arranged. The development of dance from primitive ritual to present day recreational and art forms of the dance. Includes ethnologic dance, practice and discussion of fundamental movement techniques, and composition.
- 138 Organization and Administration of Physical Education (3)** Krupa
Spring—as arranged. Organization and administration of physical education programs in elementary and secondary schools and in colleges. Study of plants, fields, equipment, and programs.
- 151-52 Recreational Leadership Activities (1 to 3-1 to 3)** Abernethy
1961-62 and alternate years: academic year—evening. *First half:* basic skills for the preschool and school-age child. Laboratory practice in crafts, music, dramatics, physical and social activities. *Second half:* basic skills for the teen-age and adult. Arts and crafts, dramatics, physical and social activities.
- 161 Community Organization for Recreation (3)** Thompson
1962-63 and alternate years: fall—evening. Resources, principles, and methods in organizing community recreation services.
- 162 Administration of Community Recreation Programs (3)** Thompson
1962-63 and alternate years: spring—evening. Factors and problems in administering recreation including surveys, legislation, program, area, facilities, leadership, finance, and public relations.

REQUIRED AND ELECTIVE COURSES FROM OTHER DEPARTMENTS

PSYCHOLOGY

- 22 Introduction to Educational Psychology (3)** Lindley, Faith
Fall—evening; spring—morning; summer 1961. Consideration of individual and group differences, adjustments, and the psychology of learning in relation to education and training.
- 29 Child Psychology (3)** Johnson
Fall—morning; spring—evening. A genetic approach to the study of the child. Special emphasis is placed on the socialization process, learning, and the child's view of the world.
- 121 Educational Psychology (3)** Lang
Spring—evening. Advanced course in educational psychology. Designed for those with background in education and psychology.
- 129 Introduction to Counseling and Guidance (3)** Dreese
Fall—evening; summer 1961. A survey of the basic principles, techniques, and procedures as applied to vocational, educational, and personal counseling.
- 131 Psychological Tests (3)** ———, Hunt
Fall—morning; spring—evening; summer 1961. A survey of psychological tests and their more common uses in business, industry, government, law, medicine, and education. Material fee, \$7.

- 141 *Leadership, Group Behavior, and Student Life* (3) Faith
Fall—morning. A survey of the foundations of leadership, of the factors which underlie effective participation in group activities, and of the interrelations between the student and his university.
- 144 *Personnel Psychology* (3) Hubbard, Mosél
Fall—evening; spring—evening. Psychological concepts and techniques in personnel management and supervision. Applications to government, industry, and military organizations.
- 225 *Seminar: Mental Hygiene* (3)
Fall—evening; spring—afternoon. A study of mental health problems with special attention to needs of counselors.
- 226 *Seminar: Clinical Psychology of Childhood and Adolescence* (3) Johnson
Spring—evening. A survey of behavior and personality disorders.
- 227 *Seminar: Counseling and Guidance* (3) Dreese
Spring—evening. Recent developments and current problems in vocational, educational, and personal guidance in various types of agencies with particular reference to education. Prerequisite: educational or psychological measurements and Psychology 129 or the equivalent.
- 228 *Seminar: Techniques of Counseling* (3) Dreese
Fall—evening; spring—evening. An intensive study of the educational and psychological processes involved in counseling interviews. Specific types of vocational, educational, and personal counseling problems will be discussed. Prerequisite: 12 semester hours in testing and guidance, including Psychology 229 and 236. In exceptional cases Psychology 229 or 236 may be taken concurrently with 228.
- 229 *Seminar: Occupational and Educational Information* (3) ———, Faith
Fall—evening; spring—evening; summer 1961. Designed to acquaint vocational and educational counselors with the basic occupational and educational information necessary in counseling. Sources of data and techniques of collecting, analyzing, and disseminating for purposes of guidance.
- 231 *Test Construction* (3) Mosél
Fall—evening. The principles underlying test construction; statistical techniques in the construction, evaluation, and standardization of psychological, educational, and vocational tests. Prerequisite: a course in tests and measurements and an elementary course in statistics.
- 232 *Research: Test Construction* (3) Hunt
Fall—as arranged; spring—as arranged. Individual projects in construction and evaluation of psychological, educational, or vocational tests. Prerequisite: Psychology 231 and permission of the instructor.
- 233 *Individual Psychological Testing* (3) Johnson
Fall—afternoon; spring—afternoon. Instruction and practice in giving of the Binet and Wechsler tests. Prerequisite: an elementary course in tests and measurements. Material fee, \$7.
- 236 *Seminar: Analysis of the Individual for Purposes of Counseling* (3) Faith, ———
Fall—evening; spring—evening; summer 1961. A detailed study of individual analysis techniques with practice in handling such methods. Prerequisite: an introductory course in educational or psychological measurements.

STATISTICS

- 53 *Introduction to Statistics in Psychology and Education* (3) The Staff
Lecture (2 hours), laboratory (2 hours). Fall: lecture—morning and evening, laboratory—afternoon and evening; spring—morning and evening; summer 1961. Sources of data, tabulation, charts and graphs, averages, dispersion, quartiles and percentiles, raw scores and derived scores, frequency distributions, reliability and validity of tests, normal curve, correlation, elementary sampling, and an introduction to estimation and tests of hypotheses. Prerequisite: one entrance unit in algebra. Laboratory fee, \$9.
- 104 *Statistics in Psychology and Education I* (3) Bright
Fall: lecture (2 hours), laboratory (2 hours)—Saturday morning. Introductory study of statistical techniques necessary for application of statistics in research problems in psychology and education. Laboratory fee, \$9.
- 105 *Statistics in Psychology and Education II* (3) Bright
Spring: lecture (2 hours), laboratory (2 hours)—Saturday morning. Advanced study of statistical techniques necessary for an application of statistics in research problems. Analysis of variance, correlation techniques, chi-square applications, and sampling theory. Prerequisite: Statistics 53 or 104. Laboratory fee, \$9.

THE GEORGE WASHINGTON UNIVERSITY

Washington 6, D. C.

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Graduate Council: Doctor of Philosophy (Ph.D.)

School of Medicine: Doctor of Medicine (M.D.)

Law School: Bachelor of Laws (LL.B.), Master of Laws (LL.M.), Master of Comparative Law (M. Comp. L.), Master of Comparative Law (American Practice) (M. Comp. L. (Am. Prac.)), and Doctor of Juridical Science (S.J.D.)

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School of Pharmacy: Bachelor of Science in Pharmacy (B.S. in Phar.) and Master of Science in Pharmacy (M.S. in Phar.)

School of Education: Bachelor of Arts in Education (A.B. in Ed.), Bachelor of Science in Physical Education (B.S. in P.E.), Master of Arts in Education (A.M. in Ed.), Advanced Professional Certificate (Adv. Prof. Cert.), and Doctor of Education (Ed.D.)

School of Government, Business, and International Affairs: Bachelor of Arts in Government (A.B. in Govt.), Bachelor of Business Administration (B.B.A.), Master of Arts in Government (A.M. in Govt.), Master of Business Administration (M.B.A.), and Doctor of Business Administration (D.B.A.)

College of General Studies: Associate in Arts (A.A.(C.G.S.)), Associate in Science (A.S.(C.G.S.)), Associate in Secretarial Administration (A.Sec.Adm.), Bachelor of Arts (A.B.(C.G.S.)), Bachelor of Science in Cartography (B.S. in Cart.), Master of Arts (A.M.(C.G.S.)), Master of Arts in International Affairs (A.M. in I.A.), and Master of Business Administration (M.B.A.(C.G.S.)).

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THE GEORGE WASHINGTON UNIVERSITY

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The School of Education

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The College of General Studies

1950

The Division of University Students

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The Division of Special Students

1944

The Division of Air Science

1951

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The
George
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Bulletin



SUMMARIES OF
DOCTORAL DISSERTATIONS
1961

WASHINGTON 6, D. C.

NOVEMBER 1961

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DISSERTATIONS
1961

VOLUME LXI

NOVEMBER 1961

NUMBER 2

PREFATORY NOTE

This number of the University BULLETIN contains summaries of the dissertations which have been accepted during 1961, in partial satisfaction of the requirements for the degrees of Doctor of Philosophy, Doctor of Juridical Science, Doctor of Education, and Doctor of Business Administration at The George Washington University.

AVAILABILITY OF DISSERTATIONS

The dissertations in typescript form are filed in the University Library, where they may be consulted by students interested in examining the complete texts.

Information about interlibrary loans or photoprint and microfilm copies of dissertations listed in this and earlier issues may be obtained from the University Librarian.

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SUMMARIES OF DISSERTATIONS
SUBMITTED FOR
THE DEGREE OF DOCTOR OF PHILOSOPHY

THE PRESENCE OF A SOLUBLE HEMOLYSIN IN CULTURES OF PATHOGENIC LEPTOSPIRAS

by AARON DAVID ALEXANDER*

A chance observation disclosed the presence of a soluble hemolysin in cultures of a newly isolated strain of leptospira. Serologic studies disclosed that this isolate was a new heterologous member of the *hebdomadis* group. It was designated *Leptospira hemolytica*. Examination of 36 strains representing diverse serotypes disclosed that the production of hemolysin was not a generic characteristic but was restricted to specific serotypes.

The hemolysins were most potent for sheep, bovine, and goat red blood cells. Other mammalian erythrocytes were unaffected or lysed to a lesser degree. Differences in the spectrum of activity for mammalian red blood cells, noted among various leptospiral hemolysins, were related to quantitative factors. A second type of hemolysin was noted in cultures of *L. biflexa*, *L. andamana*, and *L. semaranga*. These strains showed the most profuse growth of 36 strains that were simultaneously tested. The hemolytic substance was active against rabbit, rat, and hamster cells but not against sheep cells. This activity may reflect the presence of hemolytic lipid hydrolysis products reported in other studies.

The concentration of hemolysin in actively growing cultures increased with increasing cell density. The activity of mature cultures was essentially located in the supernatant moiety; relatively little hemolysin was found in leptospiral cell lysates. For some strains of *L. pomona*, production of hemolysin was favored at the more alkaline range of leptospiral growth. Hemolysin was also produced *in vivo*, in the allantoic fluid of embryonated hen's egg that was infected with *L. pomona*.

The soluble hemolysin was nondialyzable. It could be freeze-dried and stored at -60 C with relatively little loss of activity, but it was inactivated by heat. The activity was markedly reduced or lost after exposure of hemolysin to 56 C for 15 to 30 minutes. Hemolysin from culture milieu could be precipitated by 45 per cent ammonium sulfate saturation. Employing an alcohol fractionation scheme for the separation of proteins, hemolysin was precipitated from culture supernatant fluid with the globulin components. Precipitated hemolysin was found to be insoluble in distilled water (pH 5.2). These observations indicated that hemolysin was a protein. The demonstration that trypsin destroyed the activity of hemolysin afforded additional evidence in this regard.

In kinetic studies employing concentration, temperature, and pH variables, hemolysin behaved like an enzyme. When per cent hemolysis was plotted as a function of time, employing successive dilutions of hemolysin (fractionated with ammonium sulfate), a consecutive series of sigmoid curves was obtained with decreased slopes and increased induction periods as the concentrations of hemolysin decreased. The rate of hemolysis was directly proportional to the concentration of hemolysin. This series of curves, typical for bacterial hemolysins, was not obtained with untreated culture milieu and was attributed to the presence of substances that inhibited hemolysis. The inhibitory effects of normal serum, a constituent of leptospiral media, was noted in other experiments.

* B.S. 1938, College of the City of New York; M.S. 1953, The George Washington University; Ph.D. conferred February 22, 1961. Professor in charge of research: Angus MacIvor Griffin, Professor of Microbiology.

Studies on the effect of various incubation temperatures on the rate of hemolysis disclosed no activity at 0 C and an increase in the rate of activity up to 45 C; at 56 C, the rate of heat inactivation of hemolysin exceeded that of the lytic activity.

The lytic activity of hemolysin for sheep cells was also influenced by the pH of the medium in which the reaction took place. The activity increased as the pH increased from 6.1 to 7.3; optimum titers were obtained in the pH range of approximately 7.3 to 8.8. During these studies it was noted that hemolytic titers in phosphate buffered diluents were appreciably lower than in diluents containing divalent cations. Further tests showed that magnesium ions were required for hemolytic activity and that calcium and strontium ions inhibited activity.

Leptospiral hemolysin could not be related to the two large groups of bacterial hemolysins, the O-labile hemolysins and the lecithinases. Exposure to oxygen and cysteine did not alter the activity of hemolysin. Leptospiral hemolysin did not turbidify an egg-yolk saline solution.

Cross neutralization studies were conducted with three hemolytic serotypes, *L. hemolytica*, *L. djatzi*, and *L. pomona*, that shared no common agglutinogens. Two of the serotypes elicited in inoculated rabbits antihemolysins that neutralized the activity of the homologous and heterologous hemolysins. Within the limitations of test procedures antigenic differences amongst hemolysins could neither be affirmed or denied.

The presence of a soluble hemolysin in specific serotypes and their spectra of *in vitro* activity for mammalian erythrocytes are consistent with the clinical observations of leptospirosis in man and animals. Hemolysin may play an important role in the virulence of strains, in the pathogenesis of infections, and in immunity.

STUDIES ON A SUCCINOXIDASE INHIBITOR FROM *HYDRA*

by EDWARD SAMUEL KLINE*

During the course of a study on the respiratory enzymes of *Hydra littoralis* it was found that this animal was deficient in succinoxidase activity. This was surprising, since practically all animals have a common system for metabolizing energy sources, and an integral part of this system is the succinoxidase complex. Convinced that some explanation other than the absence of succinoxidase in this animal's tissue must be evoked, the presence of an inhibitor in some part of the *Hydra* was postulated. By showing that a crude extract from the *Hydra* was able to decrease the succinoxidase activity of a mouse liver homogenate this hypothesis was confirmed. Based on these findings an effort was made to identify the source and nature of this inhibitor, to study its physical and chemical properties, and to determine its mode of action on the respiratory system of various tissues in the mouse. An attempt has been made to correlate the experimental findings with what we believe to be the normal function of the toxin in the living *Hydra*.

Coelenterates have long been known to contain poisonous materials in their nematocysts, or stinging bodies. Studies from various laboratories have shown that this toxin is composed of a protein or protein-complex, quaternary ammonium salts, possibly a polysaccharide component, and maybe one or more than one hydroxyindolamines and/or hydroxyindoles. The total biological effect of the toxin appears to be due to the interaction of some or all of these components, and each of them alone is able to produce some toxic effects on experimental animals. It seemed reasonable to postulate as a working hypothesis that the succinoxidase inhibitor from the *Hydra* is a part of this toxin. To test this hypothesis a technique was developed which caused the *Hydra* to discharge its nematocysts into the surrounding solution. This was accomplished by exposing the live animals to an electric current. The succinoxidase inhibitor was found to be present in the solution, giving evidence that the material is a component of the nematocyst toxin.

The inhibitor has been isolated and considerably purified. The purified inhibitor has all of the characteristics of a protein. It gives positive tests with the common protein reagents, has a typical ultraviolet absorption spectrum, amino acids are liberated on hydrolysis, and trypsin digestion abolishes the succinoxidase inhibitory action of the material. This latter point, in addition to establishing the protein nature of the material, shows that the inhibitory activity is identified with the integrity of the protein molecule. In the ultracentrifuge the inhibitor shows one slow moving peak. It is certainly devoid of any gross contamination, but we do not have sufficient information to say that it is a homogeneous material. As yet we have not been able to demonstrate the presence of nonprotein material in the purified inhibitor, but the possibility does exist that such materials may be present.

The mechanism of action of this inhibitor has been studied on the respiratory systems of the mouse, particularly succinoxidase. In studying such effects one hopes that information can be obtained which will add to our understanding of the sys-

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From Chance (e.g. 102):

Succinate \rightarrow fp \rightarrow cyt. *b* \rightarrow cyt. *c*₁ \rightarrow cyt. *c* \rightarrow cyt. *a* \rightarrow \rightarrow cyt. *a*₂ \rightarrow O₂

Succinate \rightarrow fp \rightarrow factor \rightarrow cyt. c_1 \rightarrow cyt. c \rightarrow cyt. a \rightarrow \rightarrow cyt. b \rightarrow cyt. a_3 \rightarrow O_2

The nature of the inhibition, that is, the fact that it does not affect the components of the succinoxidase system indiscriminately, indicates that it is a specific inhibitor. Other evidence for this is that calcium phosphate gel and denatured protein do not overcome the inhibition once it has been established, and that the degree of inhibition is approximately the same both in the presence and absence of cyt. *c*.

Experiments designed to determine if the material from the *Hydra* can damage the *in vivo* succinoxidase of the mouse have been inconclusive, but the purified inhibitor is toxic to this animal as well as to the fiddler crab. In the studies with the fiddler crab the most pronounced symptom was the inability of this animal to right itself when placed on its back. This toxicity is added evidence that the material is a component of the nematocyst toxin in *Hydra littoralis*.

STUDIES ON THE MECHANISM OF ACTION OF SOME PYRAZOLO (3,4-d) PYRIMIDINES IN *ESCHERICHIA COLI* AND *BACILLUS CEREUS*

by ERNEST FREDERICK ZIMMERMAN*

In cancer chemotherapy, antimetabolites have been employed in the hope that tumor cells interact preferentially with the drug which subsequently kills the cells by altering their metabolism. In the present investigation a group of pyrazolo (3,4-d)pyrimidines, which are analogs of normal purines, have been studied in bacteria to elucidate their mechanism of action. It is expected that conclusions from such studies may lead to an understanding of carcinostatic action of the analogs.

The bacterial systems used for these studies were: *B. cereus*, strain 569 H, a constitutive penicillinase-producing mutant; *E. coli* B, a wild strain; and *E. coli* B-96, a mutant with a genetic block in the *de novo* synthesis of purines. 4-Aminopyrazolopyrimidine (4APP), an analog of adenine, in a concentration of 150 mg/l, was found to increase the generation time of both *E. coli* and *B. cereus* by about 30 per cent. 4-Hydroxy-6-aminopyrazolopyrimidine (HAPP), an analog of guanine, in the same concentration also increased the generation time of *B. cereus* by 30 per cent, whereas it had practically no effect in *E. coli*.

4APP did not grossly alter the shape of *E. coli*, nor did 4APP and HAPP in *B. cereus*, although the size of *B. cereus* may have been slightly increased by both drugs.

The growth inhibition of 4APP and HAPP in both bacterial systems was partially or completely relieved by adenine and guanine, respectively. However, potentiation of inhibition of growth occurred when guanine was added to the bacterial culture containing 4APP or when adenine was added to the bacterial culture containing HAPP. Hypoxanthine partially relieved the growth inhibition of 4APP in *E. coli* and partially relieved the inhibition of 4APP and HAPP in *B. cereus*, probably due to its ready conversion to other purine compounds effective in overcoming the action of the drugs. All vitamins tested in both bacterial systems failed to relieve inhibition of growth produced by the drugs.

4APP in *E. coli* and 4APP and HAPP in *B. cereus* all depressed the uptake of formate-C¹⁴ into nucleic acids and thus depressed *de novo* synthesis of purines to a greater extent than that of the control for the same increase in turbidity (growth). When the potentiator of each drug was added to the bacterial culture with the drug, formate incorporation was further depressed. Additional proof that 4APP depressed *de novo* synthesis of purines was furnished by the depression of 4-amino-5-imidazole-carboxamide (AICA) concentration. This normally accumulates as a consequence of the genetic block in *de novo* purine synthesis in an *E. coli* mutant (B-96). HAPP depressed *de novo* synthesis (AICA accumulation) about 1/2 as much as 4APP, at the same drug concentration (150 mg/l), which may partially explain the slight growth inhibition in *E. coli* caused by HAPP, i.e. poorer *de novo* inhibition.

Labeling both bacteria with adenine-8-C¹⁴ or guanine-8-C¹⁴ and measuring the specific activities of purine ribonucleotides revealed that purine interconversions

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were limited. In *E. coli*, 4APP stimulated the conversion of guanine-C¹⁴ to ribonucleic acid AMP, to an unknown ribonucleotide and to a soluble metabolite, adenosine. In *B. cereus*, HAPP stimulated the conversion of adenine-C¹⁴ to ribonucleic acid GMP. Both stimulations are thought to occur as a compensation for the depression of *de novo* synthesis. In *B. cereus*, 4APP decreased the conversion of guanine-C¹⁴ to ribonucleic acid AMP. In addition, the accumulation of a soluble metabolite, probably either xanthine, xanthosine or GMP, suggests suppression of conversion of XMP to GMP or that of GMP to GDP or GTP. This effect of 4APP on the interconversion was seen when the potentiator, guanine, was absent while the effect of 4APP on the interconversion of GMP to AMP is seen only in presence of guanine.

Neither HAPP nor 4APP led to a significant suppression of protein or lipid biosynthesis in *E. coli* or *B. cereus*, as measured by incorporation of labeled amino acids and acetate, respectively. Cell wall synthesis in *B. cereus*, measured by incorporation of tritiated diaminopimelic acid, was not depressed by 4APP or HAPP. The active form of 4APP is thought to be the free base, since no free nucleotide of 4APP-H⁺ was found in the soluble fraction of *B. cereus* by the methods employed, and no incorporation of 4APP-H⁺ was found in RNA and DNA of *E. coli*. Furthermore, 1-methyl-4-aminopyrazolopyrimidine (MAPP), a derivative of 4APP methylated where ribosidation would take place, was found to depress *de novo* synthesis of purines in the *E. coli* mutant. Since the analog was biologically stable it also must have activity as the free base.

It is concluded that the drugs inhibit growth partly by blocking *de novo* synthesis of purines which in turn leads to a depression of nucleic acid synthesis and growth. Potentiation of drug-induced growth inhibition by purines would then be caused by an additional depression of purine *de novo* synthesis, leading to a further depression of nucleic acid synthesis and growth. Nucleic acid synthesis is depressed in presence of the purine due to a limitation in the interconversion of purines.

THE RESPONSES OF SINGLE UNITS IN THE OLFATORY BULB TO ODORS

by MUNISWAMAPPA BASAVARAJU*

There is no acceptable theory of the neurophysiological basis of discrimination. Therefore, it was felt that an investigation of responses of single units in the olfactory bulb to odors could throw light on the mechanism of discrimination.

Anesthetized rabbits were used as experimental animals and long term recording techniques were employed.

The origin of spontaneous activity was investigated. Complete section between the bulb and the cerebrum did not produce any changes in the level of spontaneous activity to the bulb. Procaine HCl, sprayed into the nostrils to anesthetize the olfactory epithelium, reduced greatly the activity but did not abolish it completely. It is concluded that most of the spontaneous activity of the bulb is due to the spontaneous activity of the receptors.

The responses of single units of the bulb to olfactory stimulation were studied. The response to olfactory stimulation was seen either as an increase in the frequency of discharge, which is called an excitatory response, or as an inhibition of spontaneous activity, which is called an inhibitory response.

An excitatory response shows both a phasic and a tonic component. The magnitude of the phasic component is determined by the intensity of stimulus; the greater the intensity the bigger is the response. The level of tonic component is also determined by the intensity of stimulus. At the lower intensities used in these experiments, tonic level is seen to be about 50 per cent of the peak amplitude and at higher intensities it drops below the 50 per cent of the peak amplitude.

The time of recovery, i. e., the time taken for the spontaneous activity to return to its original level after cessation of stimulus is determined by the duration of stimulus and its intensity, longer durations and higher intensities showing longer recovery periods.

The inhibitory responses were seen to be mirror images of excitatory responses. The responses show complete inhibition of spontaneous activity initially, and then gradually the spontaneous activity returns, but stays at lower than the original levels. After cessation of stimulus there is a rebound. The degree and duration of inhibition and rebound is determined by the intensity of stimulus, greater intensities bringing about greater degree and duration of inhibition and the rebound being more prolonged.

The inhibitory responses to brief stimuli did not reveal any relationship to the type of odor employed. The same odor sometimes inhibited a unit, gave excitatory responses in others, and the same unit showed both types of responses to different odors. Therefore, it is concluded that modulation of spontaneous activity is unlikely to be a basic mechanism of discrimination. Inhibition is thought to be a contrast mechanism.

The excitatory responses to brief stimuli showed a variety of temporal patterns. The responses could be generally classified into three types—Type I, showing a sudden rise and a gradual fall; Type II, showing a sudden rise and sudden

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fall; and Type III, showing a gradual rise and a gradual fall. However, patterns intermediate between these types are also observed. A single odor in different units was observed to give different patterns of responses. So temporal pattern of response has no significance in olfactory discrimination. Temporal pattern is thought to be determined by the location of the epithelium which is projecting on to the particular unit under study and the ease with which odor could reach that part of the epithelium and be flushed out.

The responses to brief stimuli show a high degree of specificity to a particular odor or a group of related odors. Specificity of response to a single odor is possible if the receptors converging on a particular unit are likewise specific. Specificity to groups of odors could be due to convergence of different types of receptors, or the same type of receptor might be specific to all odors of the group. The latter is thought to be more probable. These specific receptors are differentiated in such a manner as to react to some unknown molecular parameter of the odor. It is probable that the same odor is capable of stimulating many different types of specific receptors. It is suggested that the unknown molecular parameters involved are the steric configurations of an odor.

In addition to specific units, nonspecific units are also found which respond to most of the odors, unrelated physicochemically or qualitatively.

On the basis of these results a theory for the neurophysiological basis of olfactory discrimination is put forward. According to this theory, information about molecular parameters (probably information about the shape of the molecule) is transmitted along multiple pathways to the higher cortical levels where a particular odor is interpreted to have a particular quality of smell. The contrast mechanism aids in transmitting signals of environmental change without disturbance of the noise of the spontaneous activity.

DIFFUSION OF MICROBIAL GROWTH FACTORS THROUGH HUMAN TEETH AND ITS EFFECT ON *IN VITRO* DENTAL CARIES

by LEE ROY BROWN, JR.*

This study was based on the hypothesis that carious lesions, specifically the deep penetrating, discrete lesion associated with an invasion of microorganisms into the dentin of the tooth, result from the attempt on the part of these organisms to obtain essential nutrients that diffuse outward from the pulp of the tooth.

The existing theories concerning the causes and development of caries stress the interaction of a static tooth surface and its local, external environment. These concepts do not take into account the biological aspects of changes occurring within the tooth. The *in vivo* diffusion of dyes and radioisotopes have demonstrated repeatedly that the tooth is a permeable structure which can readily take up substances from the blood. In this respect the tooth can no longer be considered an entity that cannot be influenced by systemic processes, but instead must be looked upon as an integral part of the body reflecting many of its metabolic changes. However, the significance attached to tooth vitality, as reflected by permeability, has been slight and primarily associated with protective regenerative processes.

Although the permeable nature of the human tooth has been well established by showing the passage of substances through teeth, the quantitative relationship between the diffusion of different substances has not been studied. In addition, studies concerning the influences of diffusion on the physiologic and pathologic processes involving teeth have been neglected.

Efforts to reproduce, *in vitro*, the appearance of naturally occurring lesions have been restricted primarily to the external effects of acid and bacterial cultures on tooth surfaces and, to date, no one has provided evidence of having produced an experimental lesion which simulates all the characteristics of a clinical lesion.

This study was concerned primarily with three aspects of tooth permeability: (1) the possible diffusion of different microbial growth factors through teeth, (2) the determination of diffusion rates for various growth factors, and (3) the influences of diffusion on pathologic processes in teeth as indicated by the effects on the development of *in vitro* caries of growth factors diffusing through teeth.

Thirty-eight extracted teeth (unerupted third molars) were mounted individually in plastic tubes designed to form an external seal between the crown and the root of the tooth. The crowns of the teeth were covered with distilled water and the roots were immersed in separate solutions of L-tryptophane, niacin, pantothenate, and folic acid, or a solution containing all four nutrients. Using standard microbiologic assay techniques, the nutrients diffusing through teeth were measured by sampling the crown solutions at regular intervals. The dentin of the teeth then was exposed by drilling through the enamel by means of a dental bur; and measurements for the diffusion of nutrients through dentin alone were made. L-tryptophane, niacin, calcium-D-pantothenate, and folic acid diffused outward from the roots to the crowns of teeth at a constant, measurable rate whether

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diffused separately or in combination. The growth factors diffused through dentin (drilled teeth) at rates 6 to 23 times greater than through intact (undrilled) teeth.

A single growth factor diffused at approximately the same rate when diffused alone as when diffused in combination with others. This indicated that the diffusion of one nutrient was not significantly altered by the presence of another.

On the other hand, significant differences were found between the diffusion rates of different growth factors. This was observed in diffusion through both dentin and intact teeth. Generally, folic acid, which has a molecular weight 2 to 4 times greater than the other growth factors studied, diffused at a slower rate. Niacin, which has the lowest molecular weight of the compounds used, diffused at a faster rate. However, the differences in diffusion between growth factors could not be attributed to either a definite volume diffused nor to a molecular diffusion, since significant differences were found between diffusion ratios based on either the concentration or the molarity of the solutions of growth factors immersing the roots. Therefore, no conclusions could be made with respect to differences found between the diffusion rates of the different growth factors.

In comparing diffusion between different teeth, no apparent difference was noted between intact teeth, but significant differences ($P < .001$) were found between drilled teeth. These differences appear to be correlated principally with the depth of dentin through which the diffusion was occurring.

In order to evaluate the effects of diffusion on the development of *in vitro* caries, drilled teeth (mounted in the diffusion apparatus) were exposed for 12 weeks to *Lactobacillus arabinosus* 17/5 and *Streptococcus faecalis* R which were inoculated into various culture media covering the crowns of teeth. The effects were evaluated by the visual changes occurring in the enamel and dentin, microradiographic changes, and the microscopic findings in histological sections.

The significance of the diffusion of growth factors through teeth lies in the fact that all four of the nutrients, alone and in combination, diffused through dentin in sufficient amounts to support the growth of organisms on the crowns of teeth. This was evidenced by the fact that when the growth of *L. arabinosus* or *S. Faecalis* in deficient media depended upon the diffusion of one or all four nutrients via the pulp chamber, growth closely paralleled that obtained when a complete medium covered the crowns. However, growth of the organisms in teeth was negligible when a medium deficient in a single growth factor covered the crowns and the missing nutrient was not supplied by diffusion. Therefore, the tooth itself was unable to replace the essential nutrient.

Where the growth of organisms depended upon the diffusion of one or all four growth factors from within the tooth, the *in vitro* caries produced, resembled natural caries in that the lesions were discrete and progressed down enamel fissures; the lesions spread laterally at the dentino-enamel junction; and upon entering the dentin, penetrated deeply toward the pulp chamber. The dentinal tubules within these lesions were invaded with microorganisms. It is believed that these lesions resulted from the bacterial penetration which in turn was induced by the growth factors being supplied (diffused) from within tooth instead of being added externally to the crown surfaces. Therefore the site of optimal growth would be somewhat restricted to those interfaces where the medium becomes complete and in this way induce the penetration of the organisms into the tooth.

Where the crowns of teeth were covered with a complete medium and the

teeth immersed in distilled water, the *in vitro* lesions produced did not resemble natural caries. The lesions were generalized in appearance instead of discrete; there was no deep penetration toward the pulp chamber; and there was no microbial invasion of the dentinal tubules. Since a complete medium was added to the surface and there were no growth factors diffusing via the pulp chamber, the optimal site of growth would be expected to be on the external surfaces and not within the tooth.

In considering the significance of the findings in this study in relation to natural caries, several of the variables associated with the disease, as it occurs naturally, can be regarded in a manner that offers somewhat a simplified, but reasonable explanation. The possible diffusion of growth factors in *in vivo* teeth could account for many aspects of caries which present theories fail to take into account. For example, it could explain why different teeth as well as specific areas within the same tooth are more vulnerable to a caries attack than others. In this respect, if, as claimed, the organic structures of enamel, such as lamellae and rod sheaths are pathways for microbial invasion and subsequent caries, and if enamel lamellae are attached to bacterial plaques on the enamel surface, the diffusion of nutrients through these structures could be the specific reason for their vulnerability to caries attack. The organic material itself need not be the source of nutrient for bacteria.

It is believed that there is sufficient evidence to indicate that more attention needs to be directed to the biologic aspects of changes occurring within the tooth, not only to protective or regenerative processes as a result of caries, but also to processes that could conceivably be responsible for its cause. Although it is logical that dentinal fluids derived from the pulp's blood supply may play an important role in caries by protective processes, the possibility of its role as a nutrition source for microorganisms also exists.

The question set forth at the beginning of this study was whether the source of certain nutrients essential for the metabolism of cariogenic bacteria is solely from oral fluids, or whether they may also be obtained from within the tooth. The results of this study show that nutrients can diffuse through teeth and support bacterial growth, producing changes in teeth which are associated with natural caries.

METHODS FOR THE MICROFLUOROMETRIC DETERMINATION OF HISTAMINE AND AGMATINE AND THEIR USE IN A STUDY OF MAMMALIAN DIAMINE OXIDASE

by VICTOR HUGO COHN, JR.*

The work presented in this dissertation deals with the development of methods for the microfluorometric determination of histamine and agmatine, and the application of these methods to a study of some aspects of mammalian diamine oxidase.

For the determination of histamine, the amine is reacted under alkaline conditions with o-phthalaldehyde to yield a highly fluorescent reaction product. This fluorophore is stabilized by acidification and the fluorescence is measured in a spectrophotofluorometer. Body fluids and tissues are initially deproteinized with perchloric acid and the histamine is extracted, first into n-butanol and then into dilute acid, prior to reaction with the o-phthalaldehyde. The fluorometric method makes possible the rapid determination of as little as 0.0025 micrograms of histamine in tissues or body fluids without interference from any of the known precursors or metabolites of the amine.

Agmatine was also found to condense with o-phthalaldehyde under alkaline conditions to yield a fluorescent reaction product. This fluorophore was relatively stable in base, but was rapidly destroyed under acidic conditions. An extraction procedure identical to that used for histamine was found to be also satisfactory for agmatine. This method, the first quantitative method for the determination of agmatine, is capable of measuring as little as 0.03 micrograms of the compound.

The ability of the fluorometric methods to measure very small amounts of histamine and agmatine was utilized for the development of an assay for diamine oxidase using either amine as substrate. The enzyme preparation used was either a whole homogenate of tissue, or the supernatant fraction of a 9000 x g centrifugation. It was possible to measure the enzyme activity reliably in small amounts of tissue without any further purification, fractionation, or dialysis. Either histamine or agmatine, in very low concentrations, was incubated with the enzyme preparation under standardized conditions, and the amount of the amine remaining after an appropriate incubation period was determined fluorometrically. Diamine oxidase activity was expressed as the amount of substrate metabolized per unit time per gram of tissue. The addition of small concentrations of the specific diamine oxidase inhibitor, aminoguanidine, to the incubation media completely abolished the disappearance of substrate.

Agmatine is considered a classical diamine oxidase substrate; the situation is not so clear with regard to histamine. Some investigators consider the "histaminase" activity of enzyme preparations distinct from the "diamine oxidase" activity. Enzyme preparations from several tissues of the common laboratory mammals were prepared and were shown, in each case, to utilize both histamine and agmatine as substrates. The relative activity of the enzyme towards histamine and agmatine was approximately the same for all sources of the enzyme examined, with

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the exception of guinea pig liver. This latter displayed relatively more histamine metabolizing activity. The metabolism of both substrates was affected in a completely parallel way by a series of enzyme inhibitors. Three compounds, aminoguanidine, urocanyleholine, and sodium cyanide, each inhibited both "diamine oxidase" activity and "histaminase" activity to the same extent at any given concentration of the inhibitor. Conversely, two compounds, that would not be expected to inhibit diamine oxidase, phenylcyclopropylamine and p-chloromercuribenzoate, had no influence on the ability of the enzyme preparations to metabolize either histamine or agmatine. These data, together with experiments showing that agmatine could serve as a competitive inhibitor of histamine metabolism when both amines were incubated simultaneously with the enzyme, support the identity of "histaminase" and "diamine oxidase."

The dependence of the reaction velocity of diamine oxidase on substrate concentration was determined, and the Michaelis constant (K_m) was shown to be approximately 5×10^{-6} moles/liter for histamine and guinea pig liver diamine oxidase, 3×10^{-6} moles/liter for agmatine and guinea pig liver diamine oxidase, and 3×10^{-5} moles/liter for histamine and hog kidney diamine oxidase. It appears that the higher values reported by other investigators for the K_m may reflect the substrate inhibition observed when high concentrations of histamine or agmatine are used as substrates for diamine oxidase. The difference in K_m between guinea pig liver diamine oxidase and hog kidney diamine oxidase, as well as the data showing a somewhat different ratio of activities of guinea pig liver diamine oxidase towards histamine and agmatine compared to other sources of the enzyme, may reflect slight differences in the chemical structure of the enzyme derived from different sources, i.e., diamine oxidase represents a family of closely related homologous enzymes, rather than a single discrete chemical entity.

Diamine oxidase was inhibited, both *in vivo* and *in vitro*, by compounds containing a hydrazine moiety. These inhibitors were not necessarily acting as carbonyl reagents, since substituted hydrazine compounds, such as iproniazid, 1-benzyl-2-trimethylacetylhydrazine, and 1-ethyl-2-isopropylhydrazine, were also effective diamine oxidase inhibitors. Diamine oxidase inhibition was not a corollary of monoamine oxidase inhibition; the nonhydrazine monoamine oxidase inhibitors, phenylcyclopropylamine and N,N-dimethyl-2-phenylcyclopropylamine, displayed no activity against diamine oxidase. Diamine oxidase or monoamine oxidase may be selectively and completely blocked by the choice of an appropriate inhibitor, viz., aminoguanidine for diamine oxidase inhibition, and phenylcyclopropylamine for monoamine oxidase inhibition. Experiments which showed that diamine oxidase inhibition persisted long after the drug had disappeared from the blood and tissues suggest that iproniazid produces an irreversible inhibition of diamine oxidase *in vivo*.

In experiments where histamine was incubated with enzyme preparations containing both diamine oxidase and monoamine oxidase activities, no histamine was metabolized if the diamine oxidase was completely and selectively inhibited by small concentrations of aminoguanidine. There was no change in the rate of histamine metabolism if monoamine oxidase was completely and selectively inhibited by phenylcyclopropylamine in these preparations. Several highly active sources of monoamine oxidase were shown not to utilize histamine as a substrate. These experiments show that monoamine oxidase can not metabolize histamine, a conclusion different from that of another report.

The distribution pattern of diamine oxidase in the tissues of the common labor-

atory mammals was determined and found to agree qualitatively, if not quantitatively, with previous reports. The small intestine was found to be the most important source of the enzyme in the rat, rabbit, and mouse, and an important source in each of the other species studied. With the exception of the guinea pig, liver did not display much diamine oxidase activity. Although cat kidney was found to be the most active source of the enzyme among the laboratory mammals studied, this organ was of lesser importance in other species. There was no difference found in either the distribution or activity *in vitro* of diamine oxidase in male and female rats that could account for the observed sex difference in the metabolism of histamine by this species.

A COMPARATIVE STUDY OF VERBAL CLUSTERING IN NORMAL AND MENTALLY RETARDED CHILDREN

by WILLIAM FRANCIS FLYNN*

The purpose of the present study was to compare the process of verbal clustering, a type of concept formation, in normal and mentally retarded children, in the light of Hebb's neuropsychological theory, and to investigate the relative influences of I. Q. and Chronological Age upon this process.

The retarded subjects, nearly all of them in institutions, formed three subgroups of 20 subjects each: the Low subgroup had a Mean I. Q. of 44; the Middle subgroup, a Mean I. Q. of 59; the High subgroup, a Mean I. Q. of 76. Together they constituted the large Retarded group of 60 subjects, with a Mean I. Q. of 60 and a Mean Chronological Age of 12 years, 6 months. The 20 subjects making up the Normal group, taken from the first and second grades of public elementary schools, had a Mean I. Q. of 105 and a Mean Chronological Age of 6 years, 9 months. Both the Retarded group and the Normal group had a Mean Mental Age of 7 years.

Clustering was stimulated in the subjects by the presentation of twelve pictures, each representing a simple word or percept. These twelve percepts formed four concepts, i. e., bathing, smoking, animals, and food. Each subject was tested individually, the pictures presented in an artificially randomized order. The child was asked to recall all the items he had seen in the series of pictures, and his responses recorded by the examiner. This process was repeated for a total of six trials. Verbal clustering was measured by Bousfield's Ratio of Repetition (RR), which is roughly the proportion of clusters produced, to total number of words recalled.

In order to test the effect of colored stimuli on clustering, half of the subjects in each group were tested with colored pictures and half with pictures identical to the former except for being in black and white.

In order to test the effect of behavioral rigidity on clustering, all subjects were administered the maze test from Luchins' Einstellung rigidity test battery. Performance on this test resulted in the formation of a Less Rigid group of subjects and a More Rigid group.

FINDINGS

The above experimental design resulted in the following findings:

1. There was no significant difference between the Normal group and the Retarded group in clustering score for all six trials combined.
2. On the first trial of clustering, the Retarded group surpassed the Normal group to a significant degree.
3. Although the Normal group achieved a significant increase in clustering from the first to the last trial, the clustering of the Retarded group decreased somewhat.
4. On the last trial, the Normal group surpassed the Retarded group in clustering, but the difference fell short of significance.

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5. The proportion of taxonomic (high-level) clustering was significantly greater in the overall clustering scores of the Normal group than in that of the Retarded group, but taxonomic clustering did not correlate significantly with general clustering ability.

6. There was no significant difference between the Normal group and the Retarded group as to the proportion of large clusters (three or more items) in the overall clustering scores, and the production of large clusters correlated significantly with general clustering ability.

7. With normal and retarded subjects mixed in both groups, there was no significant difference between the Less Rigid group and the More Rigid group in regard to clustering score.

8. In the Retarded group, those subjects tested with colored pictures surpassed in clustering, to a significant degree, those subjects tested with black and white pictures.

9. In the Normal group, there was no significant difference in clustering score between those subjects tested with colored pictures and those tested with black and white pictures.

10. When I. Q. and Chronological Age were correlated with clustering score in the Normal group and the Retarded group, the only significant correlation obtained was between clustering and C. A. in the Normal group.

11. There was no significant difference between the Low, Middle, and High subgroups of the Retarded group, on overall clustering score; their clustering curves differed however in that the Low and Middle subgroups declined in clustering performance over the six trials, while the High subgroup improved slightly.

12. There was no significant difference between the organic subjects and the familial subjects of the Retarded group in regard to clustering.

13. There was no significant difference between the long-term institutionalized subjects and the short-term institutionalized subjects of the Retarded group in regard to clustering.

14. In both the Normal group and the Retarded group, recall, or rote memory, contributed a significant amount of variance to clustering score; the contribution was considerably greater in the Normal group, but the difference between the two groups fell short of significance.

15. For both the Normal group and the Retarded group, the total number of words recalled rose steadily from the first to the last trial.

16. There was no significant difference between boys and girls in either the Normal group or the Retarded group in regard to clustering.

17. The proportion of More Rigid subjects was significantly greater in the Retarded group than in the Normal group.

18. On the Luchins maze test, the choice of the Extinction problems as the criterion of rigidity, rather than the Critical problems, resulted in a more equal distribution of passes-failures than would have been the case with the Criticals; the latter criterion also would have failed to differentiate between the Normal group and the Retarded group.

CONCLUSIONS

On the basis of the above findings, the following conclusions are suggested.

1. The curves of clustering in normal and mentally retarded children are compatible with Hebb's neuropsychological theory of subordinate and superior

dinate structures in the brain, as the physiological bases for percepts and concepts respectively.

2. When normal children are compared with one another, I. Q. does not appear to exert a significant influence on clustering ability, but Chronological Age does appear to exert a significant positive influence.

3. When retarded children are compared with one another, neither I. Q. nor Chronological Age appear to have a significant influence on clustering ability, but there is a marked tendency for Chronological Age to influence clustering positively.

4. When normal children and retarded children of the same Mental Age are compared on a repeated task of clustering, Chronological Age apparently exerts a greater influence than I. Q. at the beginning, enabling the retarded children to surpass the normal children.

5. At the end of a repeated task of clustering, I. Q. apparently exerts a greater influence than Chronological Age, enabling normal children to surpass retarded children of the same Mental Age.

6. It appears that clustering is increased through experimental reinforcement in normal children, but retarded children will fail to profit by this reinforcement if the concepts involved are already familiar to them.

7. Normal children are capable of more higher-level clustering than are retarded children of the same Mental Age, but higher-level clustering does not seem to be significantly related to general clustering ability in children.

8. Normal children and retarded children of the same Mental Age seem to be equal in the ability to produce large clusters, and this ability is closely related to general clustering ability.

9. Behavioral rigidity, as defined in the present study, seems to have no appreciable influence on clustering ability, pointing up the fact that the widely-theorized negative relationship between rigidity and abstract thinking has still not been reliably demonstrated.

10. Clustering can be facilitated in retarded children by the use of color in the stimuli.

11. Clustering does not seem to be facilitated in normal children by the use of color.

12. As indicated in previous studies, there seems to be no significant difference between boys and girls, whether normal or retarded, in clustering ability.

13. Length of institutionalization seems to have no significant influence on clustering ability in the case of those retarded children who spend their pre-school years with their families.

14. Rote memory contributes a surprisingly large amount of the clustering variance in normal children when they are dealing with familiar concepts.

15. Retarded children are prone to behavioral rigidity, as here defined, to a considerably greater extent than are normal children.

16. On a short series of trials, at least, there seems to be no significant difference between normal children and retarded children of the same Mental Age, in rote memory for words.

17. On the Luchins Einstellung maze test of rigidity, the Extinction problems constitute a more valid and practical criterion of rigidity than do the Critical problems of the test.

INTERMEDIARY METABOLISM OF L-ASCORBIC ACID AS STUDIED IN PURIFIED MAMMALIAN ENZYME SYSTEMS

by JULIAN NORMAN KANFER*

Two reactions concerned with the metabolism of L-ascorbic acid are described. These were studied using partially purified rat enzyme systems.

The enzyme, L-alpha-hydroxy lactone oxidase, resides in the liver microsomes. This enzyme catalyzes the final reaction of L-gulonolactone oxidation in the sequence from D-glucose to L-ascorbic acid. The microsomes were submitted to sonic oscillation in order to solubilize them and then fractionated with ammonium sulfate. The most notable characteristic of this system is the broad specificity. There exists an absolute requirement of the lactone structure, the free acid being completely inactive. Only those aldonolactones possessing an alpha hydroxyl group in the laevo configuration are converted to the corresponding ascorbic acid analogue. Thus, employing twenty-eight sugar acid lactones, it was demonstrated that only those with a laevo alpha hydroxyl were active. The corresponding epimer at carbon-2 whose hydroxyl had a dextro configuration were completely inactive. In addition, when two model compounds, D-gluco- and D-mannonosaccharinic acids, were incubated, only the epimer possessing a laevo alpha hydroxyl was converted to its corresponding two-keto analogue. On the basis of these studies, 2-keto-L-gulonolactone was postulated as the intermediate between L-gulonolactone and L-ascorbic acid. The second product of this reaction was found to be hydrogen peroxide, which appears in quantities stoichiometric to the ascorbic acid formed. The reaction is oxygen-dependent. Attempts to demonstrate the participation of the pyridine or flavin nucleotides have been unsuccessful. The enzyme is inhibited by the presence of Cu^{++} or PCMB. This inhibition can be prevented by glutathione. Thus, free thiol groups are presumed to be necessary for the reaction to proceed. The presence of chelating agents, such as α,α -dipyridyl and diethyl dithiocarbamate, also inhibit the reaction. The absence of this enzyme in guinea pigs and primates makes these species dependent upon a dietary source of vitamin C.

The second enzyme system was purified four- to five-fold from the soluble fraction of rat kidney. It had been demonstrated in a previous study that the particulate fraction derived from rat kidney nonenzymatically oxidized the reduced form of the vitamin. The system from the soluble fraction catalyzes the decarboxylation of diketo-L-gulonic acid. The products of this reaction were isolated and identified by techniques involving the use of radioactive isotopes. L-Ascorbic acid-6- C^{14} was incubated and the products isolated by Dowex-1 column chromatography. Two completely separated peaks were obtained. By suitable carrier dilution methods, one peak was found to contain L-xyloonic acid and the other L-lyxonic acid. These are pentonic acids which are epimers at the alpha carbon atom. This enzyme system is not specific for diketo-L-gulonic acid. Thus, the analogous diketo hexonic acids prepared from D-ascorbic acid and D-araboascorbic acid as well as the diketo pentonic acid prepared from L-erythroascorbic acid were actively metabolized. By chromatographic means, L-threonic- and L-erythronic acids were identified as prod-

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ucts of the decarboxylation of 2,3-diketo-L-xylonic acid. The enzymatic activity was found to be inhibited by metal chelators and sulfhydryl blocking reagents. The enzyme system catalyzing this reaction was found to be present in guinea pig, hog, and calf kidneys as well as the liver of both rats and guinea pigs.

As stated above, one of the products of the decarboxylation of diketo-L-gulonic acid is L-xylonic acid. This pentonic acid, in its lactone form, was found to be a substrate for the microsomal oxidase. The ascorbic acid analogue formed in the later reaction would be L-erythroascorbic acid. In order to verify this prediction, L-xylonolactone-1-C¹⁴ was incubated with intact microsomes. The product of the reaction was isolated by Dowex-1 column chromatography. Aside from unreacted substrate only one other radioactive peak was obtained. This product was demonstrated to be L-erythroascorbic acid by the following methods: colorimetric analysis; co-chromatography with authentic material; carrier dilution with synthetic L-erythroascorbic acid.

The significance and interpretation of these reactions were discussed.

CHICAGO, 1893-1907: THE POLITICS OF REFORM

by NICK ALEXANDER KOMONS*

"The government of cities," wrote Lord Bryce in 1893, "is the one conspicuous failure of the United States." The government of Chicago was no exception. Political machines made a sham of the democratic process. Special privilege took precedence over the public interest. In nearly all areas of government, administrative efficiency lagged behind the public need.

When Chicagoans looked for reasons for this state of affairs, they could look back to a long and tragic legacy of neglect. Chicago had always been too busy growing, too busy rising out of the wilderness, to pay attention to where it was rising, to what it was growing into. Too busy reaching for the rainbow, Chicago bothered little about such matters as corrupt city councils. But neglect and preoccupation with a pot of gold tell only part of the story. Chicago had simply outgrown its social institutions. As the city was propelled upward and outward by the industrial revolution, forces were released which government as constituted was ill-equipped to handle. Wherever poverty and suffering existed, wherever men labored long and hard for scant reward, wherever the immigrant was found in number, wherever there was rapid social and economic change, bad government flourished. Machine politics, inefficient government, special privilege, organized corruption, all depended upon a situation fraught with insecurity and change. The remedy to all this lay in easing the burden of the masses by ministering to their ills and by staying the hand of the personal and impersonal forces behind the powerful economic complex. What remedy Chicago sought is the concern of this work.

There was no sure road to reform. Those who had concerned themselves, by 1893, with the problem of bad government divided on questions of ends and means, their ideas ranging over the whole spectrum of political and social ideology. In the main, however, the major differences between reformers were the classic ones of right and left. The conservative reformers were the first to respond to the challenge of bad government. These were the men and women who rallied around the Civic Federation and made up, eventually, the most important and most consistent force for reform in the city between the years 1893 and 1907. Their ideas were not formulated all at once. With the passing of time and with the pull of events, their objectives went through a gradual metamorphosis, and even the personnel within the movement changed (with increasing rapidity as the Progressive Movement took hold at the turn of the century). Nevertheless, the group as a whole was homogeneous enough, and its objectives were consistent enough, so that certain generalizations about it hold their validity throughout the period.

Whether he came from the good government movement of the 1890's or from the Progressive Movement of the following decade, the conservative reformer was solidly grounded in the urban middle class. He witnessed with amazement and trepidation the decay of a way of life that had once been America's. He realized, of course, that he could not roll back everything that the new industrialization and the new urbanization had wrought. But he could, he believed, correct the more serious abuses within the new order. His three main objectives were ridding the

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city of boss rule and all that boss rule meant, establishing efficiency in government, and uplifting the moral tone of the community. Later he expanded his objectives to include the curbing of the more objectionable among the city's businessmen.

On the other end of the spectrum were the radical democratic reformers. As a class they did not come from any one social stratum, although they did, in the beginning, depend upon the laboring classes for their support. Within this group were representatives of the labor movement and a handful of intellectuals who came from divergent social backgrounds. The leadership of this group fell to men who were either middle class in origin or had risen to this class from essentially plebeian origins. Whereas the conservatives owed allegiance to the Republican Party, the radicals were a political hodgepodge: Democrats, Socialists, Populists, single-taxers.

On many questions of the day, the conservatives and radicals among reformers found common ground. It was, however, in emphasis and on the question of how far reform should go, where the forces looking to reform came into conflict. Throughout most of the 1890's, the radicals were interested in "bread and butter" issues. Their main concern was redressing the balance between the forces of capital and the forces of labor. Naturally, they made their appeal on the state and national level, demanding factory legislation, abolition of child labor, shorter working hours for women, regulation of railroads, and monetary reform.

But the radicals did make during the 1890's one all-important contribution to the cause of municipal reform. They suggested more clearly than anyone else the alternatives in the struggle for good city government. Obviously, bad government was not due entirely to inefficiency and to the fact that those who claimed to serve government had their price. The corrupt political machine was perpetuated by poor and rich alike, in both cases because it had favors to grant. While a handout or a job was enough to keep the less privileged in line, the rich played for higher stakes. They demanded everything of government and they generally got what they wanted, for a price: street railway rights, gas and electric franchises, low taxes and reasonable assessors. Moreover, they resisted successfully any meaningful public control over their activities, even where their activities touched the public interest. In exchange for all this, the city got virtually nothing in return, except an all too inefficient and all too expensive service.

To the radicals, the obvious remedy was to break up the chain of circumstances upon which this state of affairs depended. Government had favors to bestow. Business sought these favors. The machine was in a position to grant them for a price. The three, government, business, the machine, were interlocked, each depending upon one another. But, reasoned the radicals, if government had no favors to grant, the interlocking chain would snap, and government for special privilege would be brought to its knees.

On two occasions, in 1894 and again in 1895, the radical reformer explained the question of bad government in such terms and recommended municipal ownership of public utilities as the solution to the problem. On both occasions the radical solution was turned down at election time. At this early date, neither Chicago as a whole, nor the major portion of the forces working for reform, was prepared to go to such extremes. This, plus the fact that depression was upon the land and those elements that would have been most receptive to such ideas were preoccupied with issues that were more immediate, were the chief stumbling blocks before the radical program. Later, however, when the public utility operators posed a more clearly visible threat to the public, when good times returned, when the threat of a Bryan was no longer imminent, and when the Progressive impulse took hold, the question of municipal

ownership as the best means of wiping out government for special privilege and instituting government designed to serve the public interest, would be considered once again.

Meanwhile, the conservative reformer was not idle. During the winter of 1893-1894, he fed and housed thousands of destitute and needy, rescuing many of them from impending starvation. Other unemployed were given jobs sweeping the streets and dumping garbage; and, in the process, demonstrating to the municipal authorities and the public that these tasks could be performed more efficiently and at less cost than they were presently performed. Then, spurred on by William T. Stead's muckraking tract, *If Christ Came to Chicago?*, reformers swarmed upon the city's gambling dens, wrecking equipment, arresting gamblers, and finally forcing Mayor John P. Hopkins' hand in shutting down the wide-open town.

Intermittently, throughout the whole period of reform, Chicago conducted crusades such as these. They had little, if any, lasting effect. Organized charity did not alter in any permanent sense the physical situation of the masses. Nor did it contribute to an especially healthy relationship between those who had and those who had not, particularly when raised through such distasteful means as charity balls. The same was true of the law-and-order league aspects of the conservative good government movement. Slapping gamblers into jail or admonishing the legal authorities to see that saloons closed at the legally prescribed hour was next to useless. Morally, the community remained the same. Gambling and drinking after hours were mere symptoms of a more serious ailment. The law was simply taken lightly by everyone. Who, in fact, could Chicagoans look to for good example when the most respectable citizens of the community looted the city as they chose?

These early efforts at reform, providing charity, raiding gambling halls, sweeping streets, afford a special insight into the goals and methods of the good government reformer. In no case was he attempting to broaden the responsibilities of government. Rather, he was attempting to do the work of government himself.

But the reformer soon learned that he had to organize more effectively and take a hand, although a limited one, in politics. This was especially true when the reformer sought new legislation; and he secured this legislation by the astute employment of pressure politics. Thus he secured a civil service system for Chicago, a new and better tax law, preferential primaries, a juvenile court, the abolition of the justice of the peace system and the substitution of a system of municipal courts, a referendum law, and amendments to the city charter, affording the city more home rule. It was in this field, in improving the instruments of government, that the conservative reformer had his greatest success. These instruments still serve the democratic process well.

Yet, these instruments had only a limited success in establishing good government. The conservatives believed that civil service, primaries, a referendum, and like reforms would eventually destroy boss rule. These reforms would undo the spoils system and eliminate machine dictation at the nominating conventions. Thus, the political machine would eventually deteriorate. Nothing of the sort happened. For instance, direct primaries were no guarantee of good results. The ward boss was still free to distribute his favors among his poorer neighbors. As long as public agencies did not exist to relieve suffering wherever it appeared, then the machine would minister to society's ills. Moreover, the integrity of a civil service system, as would be proved time and again by Mayors Swift, Harrison, and Busse, depended upon the intentions of the men administering the system. This went back to the type of decision that was made on election day, which went back to the type of de-

cision the voter was capable of making, which went back to his dependence on the machine. Furthermore, the machine did not depend solely upon government for patronage. In fact, private sources, especially public utilities, probably offered as rich a field. Big business paid politicians for favors in numerous ways, not just in cash. One practice was for businessmen to hire the followers of, say, an alderman at the alderman's recommendation. Thus, a politician was assured of a loyal following that depended upon him for its livelihood. The fact that these followers did not work in city hall mattered little. This problem went back to the issue of municipal ownership.

The third phase of the good government program was direct participation in politics. In other words, reformers would compete with the machine for the approval of the voters. For this purpose the Municipal Voters' League was founded. Its job was to select honest and capable men to run for office against the corrupt gang in the City Council. The chief weapon in the hands of the MVL was publicity. With the support of most of the large circulation dailies and with money enough to launch propaganda campaigns that reached nearly every voter, the record of the undesirable candidate received a full hearing, as did the issues at stake in a particular election. Through this method the reform forces captured control of the City Council by the turn of the century, and honesty and efficiency came back to government.

But there were serious shortcomings to this method. For some very good reasons, the successes of the MVL were virtually limited to the city's middle class wards. In these wards machine politicians had never been able to establish very strong beachheads. The machine, in fact, had few functions to perform in such areas as compared to the working man's wards and the upper class wards. Machine politicians made their way in the middle class wards through the indifference of the voters. Now that the middle class had been aroused, it proved an easy matter to rout the machine politician. The story was different in the industrial and upper residential wards. Here John Powers, Michael Kenna, J. J. Brennan, Stanley Kunz, and their ilk ran up enormous majorities over their reform minded opponents. What was the power of the MVL in comparison to State Street, when State Street wanted John Coughlin elected? What could reformers do to uproot John Powers, when the majority of the voters of the Nineteenth Ward, despite two decades of effort by Hull House, were in some way indebted to and depended upon the generosity of their alderman? Thus, the MVL, as long as it remained an unofficial publicity agency, could not penetrate very deeply the stone wall of gang politics.

The MVL had another serious shortcoming. It was next to impossible to consolidate its gains into a meaningful power structure, unless, of course, the MVL became a political party, or unless it captured a political party. While on one occasion, in 1897, reformers did launch a third party, and while on another, in 1905, they captured both major parties, these were temporary efforts brought about by the special events of the moment. The good government reformer had no thought of establishing a permanent position of power within the political structure. Thus, in a sense, the MVL worked in a vacuum. The only instrument in its hands was that of persuasion. This meant keeping the public, or that portion of the public that would respond, in a constant state of awareness—a virtually impossible task. Once the public dropped its guard, once the initial enthusiasm wore off, machine politicians would be free to come back again. And they did.

It was the traction question, however, which best illustrated the shortcomings of the conservative reform program and demonstrated the disinclination of conservative

reformers to overstep some bounds, even though it meant achieving their ends. The question first confronted Chicago in 1896, when the traction interests, headed by Charles T. Yerkes, sought long-term extensions of their franchises in Chicago via the expedient route of official bribery. Within this question was a trio of important issues: official corruption, special privilege versus the public interest, the relationship between the government and the people on the one hand and the public utility interests on the other. This issue went to the root of bad government.

From the beginning, the reform forces were split over the proper solution. The conservatives wished only to establish proper controls over the traction companies and to ensure that these companies served the public interest. The radicals, however, argued that proper municipal control was virtually impossible. The power that the public utility interests wielded by virtue of their strategic position within the framework of a large corporation could never be reduced unless that framework was taken from them. It was this three cornered debate among radical and conservative reformer and public utility operator that taxed most of Chicago's energies from 1897 to 1907.

The radical point of view was the minority point of view throughout most of the period. It was used, however, at various times by most elements opposing unbridled corporate freedom as a club with which to beat down the traction lords. Once Yerkes was stifled in his attempt to acquire long-term franchises, however, the conservative reformers dropped the argument from their storehouse of weapons.

The years 1899 to 1903 saw Mayor Carter Harrison and the City Council attempt without success to negotiate a reasonable franchise agreement with the traction companies. The companies would accept no diminution of their previous rights, rights which they had secured by bribing the once corrupt City Council. This posture of the companies forced Harrison to take up the argument of municipal ownership. At first, the Mayor and a few scattered remnants of what remained of the forces that staged the Populist-Labor revolt of 1893-1894 were alone in advocating such a program. But, as service on the traction lines deteriorated from bad to worse, the message went home to the people. In 1902, Chicago returned a referendum of overwhelming proportions in favor of municipal ownership.

Sensing that the tide had turned, the conservative reformers acted quickly to control the rush to the standard of municipal ownership. What they did, essentially, was to assume the leadership looking to the acquisition of municipal ownership powers by the city. They wrote the bill giving Chicago these enabling powers to suit their own purposes and then retreated to their old position, launching a campaign of criticism against municipal ownership on the ground that it would provide a new source of patronage for the political machine.

Harrison, too, who was using municipal ownership merely as a foil, reversed his position. But the seed of municipal ownership by now had been planted too deeply. From 1903 to 1905, Harrison labored futilely to secure approval of franchise extension to the companies. Outraged by poor traction service, company recalcitrance at the negotiating table, and corporate interference in the halls of government, the public turned increasingly to those of radical persuasion for its leadership. In 1904, the city voted once again on a referendum in favor of municipal ownership. By the time the next mayoral election rolled around, Harrison had lost control of his party to Judge Edward F. Dunne and the forces demanding immediate municipal ownership of the traction lines.

On the other side of the fence, the conservative forces of reform captured the Republican Party and nominated John Maynard Harlan for mayor. Harlan ad-

vocated short-term franchise extensions with proper controls. No matter which way the decision went, Chicago could not be a loser. The forces working for reform were in command of both parties. The question before the people was how far Chicago should go in bringing public utilities under the control of government.

Chicago chose Judge Dunne and immediate municipal ownership. There was no indication, however, that the voters understood the issue for what it was. They voted for Dunne, it seems, because he promised to rid the city of the selfish interests that had manhandled the public for so many years. Immediate municipal ownership was the public's reaction to years of deplorable traction service.

Dunne had a clear mandate and was extremely optimistic that he would accomplish what he had set out to do. Strangely enough, so opposed were the conservative reformers to municipal ownership as a solution to the traction question, that they worked, first covertly and then openly, with the traction interests and business interests in general to frustrate Dunne at every turn. This fact, when compounded with some poor political judgment by Dunne, the pressure of extraneous events, and the impossible provisions of the enabling legislation granting the city municipal ownership powers, proved too formidable an obstacle to hurdle. By the end of his term, Dunne had accomplished next to nothing in arriving at a solution to the traction question.

The election of 1907 was fought out on the same issue as that of 1905, but with a difference—a difference that made all the difference. The conservative reformers were no longer in control of the Republican Party. Heading the ticket in 1907 was Fred Busse, a machine oriented politician who was in every way the embodiment of the type of politician reformers had labored so long to destroy. Nevertheless, because he was safe on the traction question, Busse was given unflinching support by the conservative good government reformers; and with the public in general fed up with the decade long struggle, Dunne and municipal ownership were turned down in favor of Busse, private ownership of traction, and bad government.

True, the final settlement was a far cry from that which Charles Yerkes tried to bring about in 1896-1899. The city was compensated for the privileges it extended, fares were lowered, service improved, and the city was given a voice in the affairs of the companies. But the major issue, that the power that the men behind the public utility interests wielded by virtue of their favored economic position would be used against the city when their interests conflicted with that of the city, was resolved in favor of special interests.

Meanwhile, Fred Busse and his cronies undid the work of twenty years of reform. Corruption, the wide-open town, boss rule, all returned. Municipal reform had simply fagged out. In a sense, it had been killed by its most ardent advocates. And then, in 1915, Chicago went full cycle. William Hale Thompson assumed office, and Chicago was its old unruly self again.

STUDIES ON THE METABOLISM OF COLLAGEN MAKING USE OF NEW PROCEDURES FOR THE DETERMINATION OF HYDROXYPROLINE

by DARWIN JOHNSON PROCKOP*

Since nearly all of the hydroxyproline in the body is found in collagen, measurements of this imino acid can be used in a relatively unique manner to follow the synthesis and degradation of collagen. In the present work the initial approach was to develop methods for the assay of hydroxyproline. The methods were then applied to several studies on the metabolism of collagen.

The method which was developed for the quantitative assay of hydroxyproline was based on a well known reaction in which the imino acid is oxidized to pyrrole and then a chromogen is formed with *p*-dimethylamino-benzaldehyde. Although several methods based on the same reaction have been published previously, preliminary experiments showed that they were inadequate for measuring hydroxyproline in impure solutions and particularly for measuring hydroxyproline in urine. In the new method specificity was achieved by extracting the pyrrole into toluene, and the assay was made applicable to urine and other biological materials by adding a measured excess of a second amino acid to control the oxidation conditions. The method was found to be specific for 0.05 μ moles of hydroxyproline in solutions containing over 50 mg of other amino acids, and because no cumbersome procedures were involved, a large number of samples could be analyzed simultaneously.

The final product of the new hydroxyproline assay was pyrrole in toluene. Since toluene solutions are suitable for determination of radioactivity by liquid scintillation techniques, a second method was developed for measuring the specific activity of radioactivity-labeled hydroxyproline. The solution of pyrrole in toluene was counted directly in a scintillation counter, and the specific activity was determined by taking an aliquot of the toluene solution for colorimetric assay. Because the initial oxidation products of hydroxyproline were not extractable by chloroform or toluene, interfering radioactive materials were removed by solvent extractions before the pyrrole was formed. The final procedure was relatively simple and could be applied directly to urine and crude tissue preparations.

The method for the quantitative assay of hydroxyproline was used to study the urinary excretion of hydroxyproline in animals and in man. In guinea pigs which were placed on a scorbutogenic diet for 3 weeks, the endogenous hydroxyproline excretion was reduced from 1.12 ± 0.10 mg per day to 0.45 ± 0.05 mg. The urinary levels rapidly returned to normal after a single injection of 10 mg of ascorbic acid. Administration of β -aminopropionitrile, a lathyric agent which produces extensive skeletal deformities, increased the hydroxyproline excretion of rats from 0.48 ± 0.06 mg to 1.32 ± 0.07 mg. As found by Ziff, *et al.* (J. Clin. Invest., 35, 579, 1956) in man, hydroxyproline excretion was found to be greater in young rats and guinea pigs than in adult animals. Our own studies in human subjects showed that the excretion of hydroxyproline was not affected by a protein-free diet or several other conditions which alter the excretion of other amino acids. A consideration of these findings suggested that the hydroxyproline in urine originates from the catabolism

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of collagen. The changes observed in hydroxyproline excretion appeared to parallel changes which others have noted in the amount of neutral salt soluble collagen in scurvy (Gross, J. Exptl. Med., 109, 557, 1959), in lathyrism (Levene and Gross, J. Exptl. Med., 110, 771, 1959), and in older animals (Gross, J. Exptl. Med., 107, 256, 1958). Since neutral salt soluble collagen is one of the first forms of collagen synthesized, it was suggested that the amount of hydroxyproline excreted in urine may reflect the amount of collagen which is in a "metabolically active" form. Measurements of urinary hydroxyproline may therefore be a valuable tool in further studies on the metabolism of collagen and in studies of pathological conditions in man.

The method for the specific activity of radioactively-labeled hydroxyproline was used to study the metabolic turnover of collagen. Although previous studies (Neuberger and Slack, Biochem. J., 53, 74, 1953) indicated that collagen was metabolically inert, the techniques used in these studies frequently made the data difficult to interpret. To investigate the metabolic turnover of collagen with a different approach, proline- C^{14} was injected into rats, and the specific activity of hydroxyproline- C^{14} in their urine was followed for several months. Since urinary hydroxyproline appears to originate from collagen, the decay of hydroxyproline- C^{14} in urine was assumed to reflect the metabolic turnover of collagen. Justification for this assumption was found in experiments which indicated that the bulk of urinary hydroxyproline is isotopically-labeled only under conditions where the hydroxyproline in collagen is also labeled. Stetten (J. Biol. Chem., 181, 31, 1949) showed that isotopically-labeled proline was incorporated into the hydroxyproline of collagen but labeled hydroxyproline was not significantly incorporated. Here it was found that after the injection of hydroxyproline- C^{14} , only the small amount of free hydroxyproline in urine was labeled and the radioactivity disappeared with a half-life of less than 0.5 days. No significant label appeared in peptide-bound hydroxyproline, the form which predominates in urine. After injection of proline- C^{14} , all the hydroxyproline in urine was equally labeled, and the radioactivity persisted for over 4 months.

In young rats injected with proline- C^{14} , the excretion curves of hydroxyproline- C^{14} indicated the presence of at least three separate collagen pools. The half-lives of two of these pools were approximately 1 day and 5 days; the results therefore demonstrated that in the young rat some collagen fractions are both synthesized and degraded rapidly. In this sense they are metabolically active and share in the same dynamic state as other body constituents. Since the half-life of the most rapidly metabolized pool was similar to that reported for neutral salt soluble collagen (Jackson and Bentley, J. Biophys. Biochem. Cytol., 7, 37, 1960), it was suggested that this pool is identical with neutral salt soluble collagen or some closely related fraction. There was less evidence of metabolically active collagen in old rats, a finding which is consistent with the diminished amounts of soluble collagen and urinary hydroxyproline in old animals.

The method for the specific activity of radioactively-labeled hydroxyproline was also used for preliminary observations on collagen synthesis *in vivo* in the chick embryo. The results indicated that collagen is synthesized by the same microsomal pathway which has been established for the synthesis of other proteins (Littlefield, Keller, Gross, and Zamecnick, J. Biol. Chem., 217, 111, 1955). Since the specific activity of free hydroxyproline was less than the specific activity of hydroxyproline in other fractions, the small incorporation of free hydroxyproline which Mitoma, *et al.* (J. Biol. Chem., 234, 78, 1959) observed does not appear to play a significant role in the synthesis of collagen in the chick embryo.

SOME ALGEBRAIC ASPECTS OF THE ANALYSIS OF VARIANCE

by SELIG STARR*

This dissertation is concerned with the investigation of certain algebraic aspects of univariate analysis of variance. The development is limited to the complete factorial, with and without replication, the pure nested or hierarchal design, and the cross-nested design, that is, a design in which both factorial and nested classifications appear. Only orthogonal or balanced designs are considered.

Associated with an n -way factorial are 2^n quadratic forms which are the sums of squares of linear forms, one for the mean, n for main effects, $n(n-1)/2$ for two factor interactions, and so on. The properties of these linear and quadratic forms are systematically examined. A new notation is introduced which simplifies the presentation and permits the easy manipulation of the forms. It is shown that their properties can be developed most naturally in terms of direct product of matrices. The linear forms are related to the observations, and conversely. The relationship of the various sums of squares to each other is examined. For example, interaction sums of squares can be expressed in terms of the sums of squares of lower order interactions in several ways. It is also noted that the matrices of the sums of squares are essentially direct products of the main effects matrices.

Using the finite population sampling model, the usual expected mean squares (EMS) for an n -way factorial are derived in a new way, and some new results are obtained in the process. First, the sums of squares of an n -way array are related to the sums of squares of all possible 2^n factorials contained within it. The relation involves the direct product of $n(2 \times 2)$ matrices, one for each factor, and dependent solely on that factor. It is shown rigorously, by induction, that the result holds for any n -way array. If the n -way array is a $P \times Q \times R \dots$, then we speak of a sub-array of dimensions $p \times q \times r \dots$, where $p \leq P, q \leq Q, \dots$. Then it follows that the sums of squares of the n -way array can be related to the sums of squares of all the sub-arrays of these dimensions contained within it. The EMS of a sample of given dimensions is then derived readily as a corollary result.

The practical problem of computing the analysis of variance tables for factorial designs is examined. A review is given of the decomposition of the total sum of squares into parts, each with a single degree of freedom, and such that the mean, main effects and interactions can be obtained. For an n -way array, the orthogonal matrix of contrasts is the direct product of n orthogonal matrices. Based on some new results on direct product of matrices proved in the paper, it is shown that this matrix of contrasts can be written as the ordinary product of n simple matrices. As a consequence, a new algorithm for computing analysis of variance tables for any asymmetrical factorial is developed. It is an extension of some work of Good who generalized the Yates' adding and subtracting algorithm for 2^n factorials to t^n factorials. Essentially, the new algorithm involves operating on a column vector by n matrices, one for each factor, in a prescribed order. The arithmetic is simple since the matrices consist of integers, most of which are zero. The computational advantage of the algorithm over the approach of using contrasts with single degrees of freedom is shown to be considerable. Starting with computed values, the original

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observations can be recovered by applying the inverse of the algorithm. As Good noted, this may be used as a check on the accuracy of the computations. However, a better procedure for checking the computations at each stage is proposed. If the usual text book method for computing analysis of variance tables is followed, an algorithm is given to systematically combine the usual computed values into the required sums of squares.

The problem of estimating missing values in an n -way complete factorial, under the assumption of a fixed model, is analyzed. It is shown that a change in the common notation reveals inherent patterns that permit the estimating linear equations to be written down, symbolically, in very simple matrix form. Rules are given for writing down the required equations, based simply on the relation of the missing values to each other in the n -way array and on various totals of known values in the array. A summary is given of the inverses of special matrices which might be useful in solving for the missing values.

Using the finite sampling model, the usual EMS for an n -fold nested classification are rigorously derived. It is first shown that the expectations of certain quadratic forms in the observations are connected in a simple way to the related quadratic forms in the population values. The matrix connecting them is a diagonal matrix which is easy to write down. The usual sums of squares and population variances are easy to express in terms of the quadratic forms, and this permits the EMS to be written down as a corollary.

The EMS for a factorial with replication are shown to be a consequence of the previous results. Also, for the complete factorial and the pure nested classification, it is shown that the usual linear models yield the same EMS. The derivation does not require the independence of all effects which is frequently assumed.

The algebra involved in deriving the EMS for a cross-nested design can quickly become involved and tedious. It is, therefore, common to develop rules for writing them down in complex cases. The new rules given in the paper are straightforward and easy to apply. By a simple device, the EMS are converted to algebraic expressions which are easy to specify for various designs. An important new feature is that only the EMS for the mean needs to be written down. Any other EMS can then be obtained by setting equal to zero certain well defined parameters in the EMS for the mean.

THE RETINAL GANGLION CELL LAYER

by JOHN MILLER VAN BUREN*

The topographical arrangement of the retinal ganglion cells was studied in higher primates and man. In the human material particular attention was paid to correlating the findings on visual acuity and visual field examination with the retinal ganglion cell pattern.

In the normal eye if the margins of the ganglion cell layers 5, 4, 3, 2, and 1 cell thick are successively plotted in a reconstruction at their respective distances from the fovea, their outlines will be found to be oval in form with the long axis of the oval placed along the horizontal meridian. The thicker layers closer to the fovea have the smallest horizontal-vertical ratio (13:10) while the 1 cell layer has a ratio of about 18:10. Particularly in the thinner layers the oval form is somewhat distorted by the large medial extension particularly in the 1 cell layer which may extend nearly twice as far on the medial as on the lateral side of the fovea.

When the position of all ganglion cells with a soma diameter over 15μ was added to the above reconstructions it could be seen that these cells reached their maximal density in the vicinity of the 1 cell layer and extended outward for another 10-15° then their density rapidly diminished toward the retinal periphery. The general pattern of distribution of these cells was again oval with the greater axis along the horizontal meridian. In individuals with normal visual acuity the maximal thickness of the ganglion cell layer showed considerable variation with extremes ranging from 4 to 7 cells in maximal thickness. The total extent of the ganglion cell layers in the retinae with a thin as opposed to a thick parafoveal cell accumulation showed no striking variations.

Despite the round appearance of the optic nerve head both by ophthalmoscopic examination and gross observation of the specimen, the retinal defect in the reconstructions was found to be a broad oval in form with the long axis oriented in the vertical or near vertical plane. This would explain the outline of the blind spot as charted on visual field examination.

Lesions destroying the ganglion cell axon in the region of the chiasm or optic tract occasioned noticeable loss of ganglion cells after several months which was well established between 1-2 years. In these instances using the ratio obtained by equating the distance between the middle of the fovea and the middle of the papilla, the human retinae could be reconstructed in terms both of retinal distance and visual angle. This permitted the superimposition of the visual field charting upon the plots of the ganglion cell patterns. Providing sufficient time had elapsed for degeneration to become evident the outlines of the visual field defects were closely mirrored by the degeneration in the ganglion cell layer. In one instance showing a severe hemiretinal degeneration a maximal parafoveal ganglion cell thickness of 4 cells was associated with normal central visual acuity while a maximum thickness of 3 cells in the homologous regions of the opposite eye was associated with reduced visual acuity. In some of the experimental material in which 20 months was allowed

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for degeneration after section of the optic tract, degeneration with cavitation was noted in the inner nuclear layer of the retina.

Lesions destroying fibers in the visual radiations were followed by degeneration of the retinal ganglion cells. The effect was slower in appearing and could not be well established by reconstruction methods until about a year after the lesion. By four years after the lesion the degeneration was of outstanding degree with gross loss of ganglion cells in the retinal segment associated with the damaged geniculocalcarine radiations. As in the pregeniculate lesions a close correlation could be made between the visual field examination and the topographic reconstructions of the ganglion cell patterns. A tendency was seen for both the areas of retinal degeneration and the visual field defect to be larger in the eye ipsilateral to the cerebral lesion.

SUMMARY OF DISSERTATION
SUBMITTED FOR
THE DEGREE OF DOCTOR OF JURIDICAL SCIENCE

INDIVIDUALS BEFORE INTERNATIONAL TRIBUNALS: DIRECT ACCESS IN PRIVATE MATTERS

by GORDON A. CHRISTENSON*

I.

This study concerns an aspect of a procedure for settling disputes under international law. It seeks to identify and analyze the procedures in modern international law and practice by which individuals have had or now have direct access to international tribunals for the determination of substantive private matters over which the tribunal has jurisdiction. Traditionally only states have had capacity to go before international tribunals. However, in the 20th century some tribunals created by treaty have been given jurisdiction over individuals, and this dissertation seeks to consider that experience.

International law while drawing on Roman law has not recognized the distinction between procedure and substance that the Roman law came to accept. Philip C. Jessup, recently appointed Judge of the International Court of Justice, has treated the status of individuals from a substantive point of view. Procedure for individuals, however, has not similarly received attention. A meaningful treatment of the procedural status of individuals before international tribunals is related to the traditional procedural remedy of espousal by states. As a condition to espousal, a national injured abroad by an international wrong must have exhausted his local remedies and sustained a denial of justice. If the interim fiction providing a remedy for a denial of justice is the espousal of an international claim, then access to international tribunals directly by individuals is the next logical step.

II.

The position of the individual in the history of international law is different from the modern view that only states are subjects of that law. After the *jus civile* gave way to the *jus gentium*, individuals were accorded direct rights under early practice. *Jus gentium* was the law of all nations and peoples. Grotius, the father of modern international law, accepted that view and believed the individual had rights under the law of nations derived from the law of nature. Puffendorf and Hobbes thereafter personified the state. Finally, Vattel said that the state as an abstract personality was the only subject of international law and that not the individual but only the state had "status." Oddly enough, the term "status" developed into the term "state." More modern writers in considering scientific experience have tended to return to the early universal view represented by the *jus gentium*. While that view is common: that individuals are subjects of at least some international law, there must be an effective procedural system directly available to the individual before international law will develop along the lines advocated by the publicists.

III.

A very interesting problem in international jurisprudence is raised when the procedural law of international claims develops into a basis for establishing international tribunals to relieve the burdens of espousal on the part of states in behalf of

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their nationals. When a state presents or espouses an international claim for one of its nationals against another state, traditionally the basis for the presentation is that only the presenting state itself is the proper claimant under international law. The underlying theory in the traditional view may be called monistic theory because there is only one party, the state, who is injured by an injury to its national. The view which may be called the dualistic theory is more realistic in recognizing that either an individual or a state or both may be the actual injured party and that the process of espousal is mainly procedural. By conferring status on individuals to permit them to bring their own claims before appropriate international tribunals, states have tacitly admitted the difference between the monistic theory, which merges substance and procedure, and the dualistic theory, which separates substance from procedure. Thus, the dualistic theory in separating right from remedy permits without any difficulty the international adjudication of claims of individuals in their own behalf without any serious contradiction to the rights and interests of states in their own behalf. This is so because espousal is essentially a remedy for individuals.

States, as traditional subjects of international law, may extend international procedural status to new persons and entities. The Permanent Court of International Justice in the Advisory Opinion concerning the *Jurisdiction of Courts of Danzig* held that states by international agreement may create rules establishing individual rights which persons may enforce directly by proceeding in a forum which derives its jurisdiction from that agreement or from some other international agreement. Moreover, the International Court of Justice extended the idea of individual rights in the cases of the *International Status of South-West Africa* and *Reparation for Injuries Suffered in the Service of the United Nations*. The latter opinion inconsistently adhered to the traditional doctrine of espousal but applied a new idea that an international organization can espouse claims of its employees. The logic of the opinion seemed to adopt the monistic theory to support its conclusion but failed to separate claims of states or of international organizations from claims on behalf of individuals which are merely presented by states or international organizations as a procedural device.

IV.

The proposed International Prize Court of 1907 would have permitted individuals direct access to bring appeals from national decisions involving the law of prize in certain cases. The proposal was adopted at the Second Hague Peace Conference of 1907, but was not ratified so that it remained ineffective. It is significant for two reasons. It was the first suggestion in the form of a treaty for the establishment of effective procedural rights of individuals in matters involving the law of prize. Second, it failed because it was too idealistic, for nations would not want an uncontrollable international tribunal to decide questions on appeal from national courts. However, its failure served to identify the reasons against providing individuals with international remedies. Accordingly, even in its pristine and naive idealism, it was the first concrete experience indicating that states desired to provide individuals with a direct international remedy.

V.

The first international tribunal with continuing jurisdiction over individuals was the Central American Court of Justice established by the Washington Convention of 1907. It lasted until 1918 when it expired because no agreement could be obtained to extend its duration. It handled five cases brought by individuals, but none

of the cases was of great significance. The attempt at providing a meaningful jurisdiction for individuals failed because the judiciary which purported to be international was controlled by the nations whose nationals were on the tribunal. Procedures for individuals became ineffectual. Moreover, the conception of such a court was too abstract. When it failed because it had no tradition or experience behind it, disillusionment with the experiment flared.

VI.

The Mixed Arbitral Tribunals established pursuant to the Treaty of Versailles successfully adjudicated thousands of war claims of nationals of the Allies during World War I. Individuals had access to the tribunals to present their claims directly without going through a government agent as required before traditional mixed claims commissions. The decisions are reported in ten volumes of reports in the French language.

Even more successful was the experiment creating rights in individuals before the Upper Silesian Arbitral Tribunal. Persons of German or Polish nationality could bring before the Arbitral Tribunal actions for diminution of vested rights as well as certain appeals from administrative bodies set up to issue circulation permits or to administer the optional clauses regarding nationality. Moreover, a unique procedure called evocation was introduced whereby domestic courts could "evoke" or refer an international question to the Arbitral Tribunal for decision. Evocation has a peculiar attraction at present in protecting national interests. In Upper Silesia, however, national courts used a protective device to reject evocation wherever possible by construing questions so as to make them domestic rather than international. A good number of cases were heard in the Upper Silesian Arbitral Tribunal, but the entire legal experiment was made historically untenable by the problems of the 1930's.

VII.

Two functional international tribunals now in existence were established under the Bonn Conventions signed in 1952. The Arbitral Commission on Property, Rights and Interests in Germany has jurisdiction over individuals in certain disputes brought by them involving appeals from decisions of German courts or agencies. The subject matter in such cases is limited by agreement to questions of external restitution or to questions of foreign interests in Germany which were settled under the Convention on Settlement of Matters Arising out of the War and Occupation. Significantly, the interests of states are protected by the possibility of appealing controversial decisions regarding the competence of the Arbitral Commission to the Arbitration Tribunal before which only states may be parties. Although the decisions of the Commission have been conservative, the two volumes which have been published are of great assistance in interpreting the rules and procedures for individuals before this and other international tribunals. The interests of states are not only protected by the right of appeal in questions of competence but may be preserved by the right of third party intervention on the part of states.

The Supreme Restitution Court has appellate jurisdiction over certain claims of individuals for internal restitution of identifiable property. This refers to property seized unconscionably, which the Allies and the Federal Republic of Germany agreed would be restituted to the true owners, if it was found inside federal territory. This Court replaced a court which was set up for this same purpose under the allied occupation authority in Germany and which exercised the same powers.

VIII.

The debt settlement agreement of 1953 between the Allies and the Federal Republic of Germany is the first comprehensive attempt to settle both public and private external debts affected by war. A series of intricate tribunals and commissions was established to cope with the problems of the debt settlement. Jurisdiction encompasses private debts and permits individuals to be parties before the various courts. The scheme of tribunals with their inter-relationships and enforcement procedures is highly complex. But it is also of necessity the only practical way of managing a comprehensive debt settlement.

The Arbitral Tribunal is the supreme appellate body to which only states can bring disputes regarding questions of fundamental importance which are raised in inferior bodies before which individuals may go to have certain private claims decided. However, individuals have both the right to appeal from decisions of the Courts of Arbitration to the Mixed Commission and original access to the latter. The type of debt determines the procedure which is to be used and the sanction for failure to observe the procedure. The Arbitration and Mediation Committees may also be classified as tribunals which serve a commercial arbitration function. The debt settlement and its tribunals show that a variety of international tribunals serving a functional purpose can protect national interests while at the same time providing procedures for individuals in private matters.

IX.

The three European Communities, Coal and Steel, Euratom, and the Common Market, have a common Court of Justice which has jurisdiction over certain cases brought by individuals to protest against decisions regarding price, tariff, or injurious practices or orders by the executive authorities of the Communities. As developed in case law, the Court has enlarged its jurisdiction by using the doctrine of "detournement de pouvoir," derived from French administrative law. In addition to the administrative appeal, there are also other types of jurisdiction which may be identified as civil, criminal, and international in the traditional sense. The main value of the Court of Justice is that it affords individuals protection against a very powerful economic union of European nations. By recognizing in individuals an interest to be protected by Court action, the Communities have elevated jurisdiction over individuals to a supranational level. Procedures are also available to petition the court in certain internal matters which are purely organizational.

The two major contributions of the Communities are that through European integration a new interest above nation-states is created which recognizes the rights of individuals and that there are effective procedures for individuals as well as sanctions against individuals in the legal framework of the Communities.

X.

In international practice there is a nascent principle of procedure emerging which indicates that individuals are not denied access to international tribunals simply because of their status in relation to that of their states. The correct basis for access is whether the tribunal has jurisdiction over the party and the subject matter, not whether individuals can be legal persons under international law. Four elements of a meaningful international legal process for individuals in private matters have been discerned in the course of this study: (1) Judges must be qualified and independent; (2) jurisdiction over subject matter and parties must be effective; (3) procedures

must be available to raise international questions; and (4) the decisions rendered by the international tribunals in favor of individuals must be effectively enforced. Every successful tribunal has contained some form of each of these principles. As noted, the most important single element is the jurisdictional question. Of the various jurisdictional devices examined in this study, the most meaningful and useful is the procedure of a functional appeal from national courts to international tribunals or from decisions of international organizations to a regional international tribunal. Other devices which are also meaningful are original jurisdiction over international claims, appeals from lower international tribunals or commissions, evocation procedures, and advisory jurisdiction. Some distinction might also be drawn between ordinary and extraordinary jurisdiction, that is, jurisdiction which is immediate and compulsory or jurisdiction based on consent of parties.

The interests, both short and long range, of states have heretofore prevented adequate development of international tribunals with jurisdiction over individuals. Using the above analysis, every reason for a traditional rejection of procedural rights for individuals before international tribunals can be overcome. This can be done without departing from traditional international law in so radical a manner as advocated by the more idealistic writers.

XI.

The conclusion that a developing rule of international practice recognizes the capacity of individuals to appear before competent international tribunals must have future international utility if it is to have any value at all. As the proper concern at the present time is about the jurisdiction of international tribunals rather than status of parties before them, the problems about the status of individuals in international law which Jessup and others have raised should now be considered in terms of jurisdiction. Every society which has survived has managed to break through primitive legal notions of status which impede the progress of a more enlightened system of law.

International procedures for individuals in private matters will help construct a system which has the potential to arrange legal rights and duties meaningfully in a changing world. Thereby future peace-enforcing institutions of public law can better reach maturity. Present attempts to transform the United Nations into a world legal system are ungrounded in the broad experience necessary for such an endeavor.

Three types of tribunals could serve this purpose of broadening international procedures: An international claims tribunal, a functional or special arbitral tribunal serving a limited goal, and a regional international tribunal. Before each of these individuals could be given direct access, utilizing the experience of the past and the experience which is quietly accumulating at the present time.

SUMMARIES OF DISSERTATIONS
SUBMITTED FOR
THE DEGREE OF DOCTOR OF EDUCATION

A STUDY OF ORGANIZED AND PROFESSIONALLY STAFFED PERSONNEL COUNSELING AND GUIDANCE PROGRAMS IN THE FIVE HUNDRED LARGEST PRIVATE INDUSTRIAL CORPORATIONS IN THE UNITED STATES

by MORRIS EDWARD SUMNER*

The trend toward the establishment of organized and professionally staffed personnel counseling and guidance programs in private industry is a social phenomenon of fairly recent origin. As is the case in most social advances, a variety of antecedents and influences can be found in recent history which have been instrumental in bringing about this change. The growing acceptance by private industry of a broader social responsibility for its workers is a movement which has been influenced and fostered by a multiplicity of factors resulting from the growth and development of American industrial, labor, social, and political institutions during the past four decades. Today, the movement is still in its infancy; its evolution has been a slow and long awaited one.

THE PROBLEM

The purpose of this study is to describe the current practices by major private industry in connection with organized and professionally staffed programs of personnel counseling and guidance. It reports the existence of such programs in the five hundred largest industrial corporations in the United States, how these programs are organized and staffed, and the variety of counseling and guidance services offered by them. This study traces the history of the development of these programs in industry and identifies factors which have been important to their growth. In addition, this study ascertains and reports on the scope, level of development, evaluation of effectiveness, and future trends of personnel counseling programs in major private industrial firms. A detailed description of the organization, staff, services, and other characteristics of one of these programs is offered. Finally, conclusions drawn from the entire study and recommendations for improving the application of psychological methods in industry are presented.

PROCEDURES

This study employed two questionnaires to locate and secure descriptive information regarding formally organized and professionally staffed programs of personnel counseling and guidance in the five hundred largest private industrial corporations in the United States.

The methods used in the analysis of the data were, for the most part, the computation of means and percentages. A basis for a comparative study of various factors peculiar to companies with and without programs was established by independent tabulations of the data involving the separate groups. Information available from sources other than the questionnaires permitted a comparative study of the responding companies with the total sample of five hundred companies. The results of these various investigations are presented in tabular form, each group being identified separately, with the comparisons indicated of those factors which seemed appropriate.

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REVIEW OF THE LITERATURE

The literature on personnel counseling and guidance practices in industry was reviewed in order to locate studies which provided information relative to:

1. The major milestones in the development of the industrial counseling movement
2. General reviews of the movement
3. The magnitude of the mental health problem in industry
4. A growing interest in the problem of employee adjustment
5. Management attitudes regarding counseling and guidance programs
6. Descriptions of programs in existence
7. Effectiveness of methods employed
8. Standards for counselors.

The conclusions and major points of emphasis of the studies chosen for discussion are presented according to the above organization for the sake of interest. A summary of the review contains a list of conclusions, problems, and conflicts which characterize the current literature in the field of industrial counseling.

FINDINGS

LOCATING THE PROGRAMS

An initial survey sent to the five hundred largest private industrial corporations in the United States revealed the existence of fifty-seven formally organized and professionally staffed personnel counseling and guidance programs. Companies with programs were compared with those companies without programs according to various common factors. Some of the conclusions, inferences, and trends drawn from these comparisons are as follows:

1. A greater proportion of companies employing between 25,000 and 100,000 employees have personnel counseling and guidance programs than do those companies employing less than 25,000 or more than 100,000 employees.
2. Among those with programs there is a tendency for the companies employing the largest number of employees to have the greatest number of personnel counseling programs. Of the companies with programs, 63.2 per cent are among the 250 largest corporations in terms of number of employees.
3. There seems to be a positive relationship between the amount of total assets of a corporation and the existence of personnel counseling programs. Of the companies with programs, 61.4 per cent were among the 250 wealthiest corporations (in terms of assets).
4. The 250 largest corporations, in terms of sales dollars for 1958 and 1959, included among their number 63.2 per cent of the companies with counseling programs.
5. In terms of profits earned on sales, companies with counseling and guidance programs tended to earn less than did companies without such programs. In neither 1958 nor 1959 did more than 45.6 per cent of the companies with programs appear among the 250 corporations earning the greatest per cent of profit on sales.
6. The Electronics-Electrical-Defense, Chemical-Petroleum, and Foods industries have, in descending order, the greatest number of personnel counseling and guidance programs. Approximately 50 per cent of the programs occur in these industries.
7. In fifty-seven corporations, 1,234,243 employees have access to organized and professionally staffed programs of personnel counseling and guidance. This constitutes 13.6 per cent of the more than nine million workers employed by the five hundred largest industrial firms in the United States.

8. The trend toward the establishment of programs of personnel counseling and guidance in industry is a social phenomenon of recent origin. Only 19.4 per cent of the fifty-seven programs were established prior to World War II, whereas 42.1 per cent of the fifty-seven programs were established during the period 1952-1959.

DESCRIPTION OF THE PROGRAMS

A second questionnaire, designed to secure detailed information about their programs, was sent to the fifty-seven companies with organized and professionally staffed personnel counseling and guidance programs. Thirty-two of these programs are described from the following standpoints:

1. The historical development of personnel counseling and guidance programs in the thirty-two companies

2. Organization and justification of current programs

3. Counselors

4. Current counseling and guidance services

5. Evaluation of current programs

6. Future trends.

A number of significant trends and changes are reflected in current practices which differ considerably from the programs as they were originally established. Pre-dominate practice has been to establish and maintain personnel counseling programs as a part of the broader personnel function; however, some dissatisfaction over a subordinate relationship to the personnel department was expressed. Preference to exist as a separate corporate division was indicated in a number of instances. Since their earlier beginning, these programs have progressed from a function which was primarily concerned with counseling for job problems and employee benefits, to more comprehensive programs of counseling, testing, guidance, and referral services. Sizes of staffs have been increased from one to five counselors in each program. Future plans call for larger staffs of better trained and more highly qualified personnel.

Most companies see a high degree of relationship between the primary reason for having a program and the major accomplishment of the program. Employee morale and personnel adjustment are the foundation and major activities of these programs. Companies readily admit that the profit motive, through improved employee selection, placement, development, and effectiveness, is a very important consideration in the establishment of programs of personnel counseling and guidance, but they also admit to a sincere concern and interest in the welfare of their employees which transcends the more restrictive profit consideration.

Few companies see the counselor solely as a psychotherapist. In most corporations, he performs collateral personnel duties in addition to this counseling and guidance function. There is a growing tendency, however, for corporations to have some full-time counseling personnel on their staffs. Reported increases in demands for counseling services, primarily in the areas of emotional and human relations problems, are probably responsible for the trend toward some full-time counseling personnel on each staff.

Evaluation of effectiveness and services of programs is a neglected area in most corporations. Only four of the thirty-two programs reported that evaluation studies had been made during the past two years. The number of companies with future plans to establish evaluation methods and techniques is indicative of only a slight increase over present practices.

Most corporations utilize counselor evaluations and recommendations in effecting employee changes in salary promotions and placement. The dual role of the counselor as therapist and adviser to management may result in a violation of professional ethics, as well as creating within the counselor an unresolved conflict of loyalty between the counselee and management. Most companies feel, however, that it is senseless to ignore the valuable contributions counselors are able to make to management in the form of recommendations and evaluations and that the employee is better served in the long run by the sharing of this information.

Planned expansions of present programs exist in approximately 50 per cent of the companies in this study. Prime areas of expansion are in counseling and testing services and in sizes of staffs. Directors of programs see as their most important future goals improvement in the areas of personal adjustment, employee efficiency and utilization, and career planning and development. Barriers to these planned expansions are seen to exist in 75 per cent of the companies. Management attitude and lack of financial support are the most outstanding hindrances to future progress. The inadequacy of trained and qualified counseling personnel is also a factor which precludes rapid future expansion.

A WELL DEVELOPED PROGRAM

A descriptive study of one formally organized and professionally staffed program of personnel counseling and guidance is presented from the standpoint of basic philosophy, organization, counselor characteristics, and other program factors. Counseling in this program is viewed as an interpersonal process which enables an individual to ventilate his feelings, explore his problem, and come to a more realistic appraisal of himself and the situation. It is a process which stimulates the individual's ability for self-direction. By helping to improve the personal and social adjustment of the employee, the counseling program is expected to cause an increase in effectiveness and general productivity.

The program was organized and remains a part of the broad personnel function of the Industrial Relations Division. The director of the program heads a staff of ten personnel coordinators who, in addition to their counseling and guidance responsibilities, perform a number of related duties. The services of the counseling and guidance program include counseling, selection, psychological testing, consultation with supervision, training, and administration. Psychological testing plays an important role in all of these functions.

The unique feature of this program is the application of evaluation methods and techniques to assess the over-all effectiveness of the program and services. Future plans call for an expansion and increased effectiveness of present services by supplementing the counseling staff through the use of trained supervisory personnel and through increased research, which includes normative and validation studies in the area of psychological testing.

RECOMMENDATIONS

The study reveals a number of weaknesses and conflicts which tend to detract from the effectiveness of current counseling practices, preclude further expansion of existing programs, and discourage the establishment of counseling and guidance services in companies which are, at present, reluctant to enter the personnel counseling and guidance field. An awareness of these problems and how they interrelate permits the author to make the following recommendations for the improve-

ment of personnel counseling and guidance services in private industrial corporations:

1. The role of the counselor-psychologist in industry should be defined in such a way that it is acceptable to the professional psychologists and managers of industry.

2. A clarification of the role of industrial psychologists in industrial medicine, particularly in regard to mental health problems, should be achieved between the joint efforts of the American Psychological Association and the American Medical Association.

3. Combined efforts of the American Psychological Association, the American Medical Association, and the Federal Government should be marshalled to precipitate a study to reveal the magnitude of the mental health and employee adjustment problem in industry, so that its importance to production and employee effectiveness is readily apparent to the managers of industry.

4. University curricula, following standards for industrial psychologist training and certification, as developed by the American Psychological Association, should be broadened to include counseling, guidance, clinical psychology, and business knowledge and experience.

5. A greater degree of sharing of experience and knowledge in the field of industrial counseling should be encouraged so that all practitioners in the field may benefit from the labors of others.

6. Certification of programs should be undertaken by the American Psychological Association in order to encourage standardization of practices and services offered by industrial counseling programs. In addition, the Association should recommend proper counselor specifications, counselor-employee ratios, records to be kept, and a variety of other practices which would encourage a unified approach to the counseling practices in industry.

7. In order to improve the effectiveness of their programs, it is recommended that industrial counselors institute evaluation studies which give accurate and reliable measures of the results of their services.

8. Industrial psychologists should utilize carefully selected and trained line supervisors to augment the already overburdened efforts of counseling staffs.

The above recommendations are offered as a goal toward which dedicated people in the field of industrial psychology may work, in order to provide those professional services which will assist members of the industrial community to realize a greater degree of personal adjustment and satisfaction in their work and in their lives.

AN ANALYSIS OF STUDENT TEACHERS' DIFFICULTIES AS RELATED TO SELECTED FACTORS

by HARRY GRUBB DETWILER*

THE PROBLEM

The purpose of this study was to determine the relationship of selected factors to difficulties encountered by student teachers in carrying out professional activities related to student teaching. More specifically, this study was concerned with: (1) identifying difficulties encountered by student teachers at the beginning and at the end of a student-teaching period; (2) determining the relationship of the following twelve factors to those difficulties encountered by student teachers: (a) age, (b) marital status, (c) progeny, (d) academic status, (e) scholastic status, (f) National Teacher Examinations score, (g) Minnesota Teacher Attitude Inventory score, (h) time of decision to enter teaching profession, (i) size of the community in which student grew up, (j) school level of preparation for teaching, (k) number of semester hours carried during student-teaching period, and (l) employment status during student teaching.

PROCEDURE

The population for this study consisted of sixty-six female student teachers in the School of Education at The George Washington University for the academic year 1959-1960. Of the sixty-six female student teachers in the population, thirty-two taught in elementary schools and thirty-four taught in secondary schools.

Two types of data were obtained from each student teacher to accomplish the purposes of the study. One type of data was concerned with the difficulties encountered in the performance of professional activities in student teaching. To secure this data, a rating scale for reporting difficulties incident to student teaching was devised. The rating scale contained eighty activities of student teachers classified within five major categories: (1) planning for learning, (2) guiding learning, (3) evaluating learning, (4) school-community relations, and (5) member of the profession. Each student was instructed to make two ratings: (1) rate each activity as to difficulty present during the first part of student teaching, and (2) rate each activity as to difficulty present at the end of the student-teaching experience.

The other type of data obtained was concerned with information related to factors that might affect performance of professional activities in student teaching. These factors are those listed under the statement of The Problem. To secure the data, a background information questionnaire was devised. Additional information not obtainable from the questionnaire was secured by administering an inventory and studying University records.

Analysis of the data obtained from the Rating Scale involved the following steps:

1. Arranging each specific activity on the scale into one of five categories: (a) planning for learning, (b) guiding learning, (c) evaluating learning, (d) school-community relations, and (e) member of the profession.
2. Setting up criterion groups on the basis of each of the twelve factors listed under The Problem.

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3. Computing the mean ratings of difficulties encountered for each criterion group in each category of professional activities.
4. Testing the significance of the difference by use of the "t" score (a critical ratio, or "t" test, of the significance of the difference between means).
5. Making an item analysis of difficulty encountered in carrying out professional activities at the beginning and end of student teaching.
6. Making a rank order of each professional activity in terms of its difficulty at the beginning and end of student teaching.

REVIEW OF THE LITERATURE

The research available for the development of the present study fell into three general classifications: (1) studies which identify activities of student teachers, (2) studies which identify problems of student teachers, and (3) studies related to changes in student teacher behavior during the student teaching experience. In these classifications, research has increased in the past ten years, but remains scant in comparison with the other areas of educational research.

Studies identifying activities of student teachers in recent years have developed categories from the list of activities with presentation as roles of the teacher. Although the categories reported differ in terminology and scope, they generally include roles in relationship to others, in directing learning, and as a member of the profession.

Studies identifying problems of student teachers reported long lists of problems elicited from student teachers and supervising teachers. Several researchers ranked the types of difficulties according to frequency reported. The problems of student teachers were also classified into broad general areas similar to those of the activities of student teachers.

Few studies were found identifying factors that influence student teacher effectiveness. Studies that were reported mostly identified factors concerned with change in the student teacher during the experience of teaching. Very few studies were found of the relationship between background factors and difficulties encountered in student teaching.

FINDINGS

No significant differences were found among criterion groups of female student teachers with respect to selected factors as related to difficulty in performing professional activities at the beginning of student teaching.

1. Age does not appear to be a significant factor in the difficulties encountered by the student teachers.
2. Married female student teachers did not encounter more or less difficulty in student teaching than single female student teachers.
3. Progeny was not related to difficulties encountered in student teaching.
4. Whether or not a student was an undergraduate or graduate had no relationship to difficulty encountered in student teaching.
5. Quality-point Index was not related to difficulties encountered in student teaching.
6. There was no significant difference in difficulties encountered by student teachers who scored low on the National Teacher Examinations as compared with those who had higher scores.
7. Scores on the Minnesota Teacher Attitude Inventory were not related to difficulties encountered in student teaching.

8. Difficulties encountered in student teaching were not influenced by the students' decisions to enter the teaching profession prior to or after entering college.

9. Students who grew up in communities of less than 25,000 population did not encounter more or fewer difficulties in student teaching than those who grew up in communities of more than 25,000 population.

10. Students prepared to teach in elementary school encountered no greater or less difficulty in student teaching than those prepared to teach in secondary school.

11. The number of semester hours carried during the student-teaching period had no relationship to difficulty encountered.

12. Whether a student teacher was employed or not employed during student teaching had no effect upon the difficulty encountered.

At the 5 per cent level of confidence, differences were found among criterion groups of female student teachers with respect to selected factors as related to difficulty in performing professional activities at the end of the student-teaching experience.

1. Student teachers age 26 years or above experienced greater difficulty than those age 20 to 25 years in planning for learning activities.

2. Student teachers with progeny encountered greater difficulty than those without, in planning for learning activities.

3. Similarly, student teachers with progeny encountered greater difficulty in participating in activities related to school-community relations than those without.

4. Undergraduate student teachers encountered less difficulty with activities related to planning for learning than those with graduate status.

5. Student teachers not employed encountered greater difficulty with activities related to professional growth than those employed during student teaching.

In the categories of professional activities utilized in this study, student teachers had greatest difficulty with planning for learning and guiding learning. Student teachers had less opportunity to participate in evaluating learning activities than in other categories. The categories, school-community relations and member of the profession, presented very little difficulty.

Under each category of professional activities, the greatest difficulties reported by the female student teachers were:

Planning for Learning

Finding enough time to prepare properly for teaching

Planning to use a variety of teaching methods in accordance with needs of the class

Budgeting and devoting the proper amount of time to each part in the daily lesson plan

Guiding Learning

Handling problems of pupil control (discipline)

Stimulating pupil interest in instructional activities

Adjusting level of content presentation to the readiness level of the pupils

Evaluating Learning

Developing cooperative evaluation techniques with pupils

School-Community Relations

Understanding the limits of the students' authority in the classroom

Learning the policy of the school concerning pupil standards of conduct

Member of the Profession

Developing suitable oral expression for classroom teaching

Avoiding personal idiosyncrasies such as repeatedly saying "uh," "O.K.," etc.

Generally, those activities that presented difficulty at the beginning of student teaching remained in the same order of difficulty at the end of the student-teaching experience. It is interesting to note that student teachers rated the following activities as being more difficult at the end than at the beginning of the student-teaching experience.

Acquiring command of subject matter needed for class instruction
Preparing daily lesson plans for teaching
Using correct grammar and spelling

CONCLUSIONS

The findings of the study imply the following conclusions:

1. The lack of research in the student-teaching phase of teacher preparation and the inconclusive evidence of relationship between the selected factors of this study to difficulties with professional activities encountered during student teaching emphasizes the importance of continued study of students engaged in teaching while still in teacher education institutions.

2. The fact that lack of time to prepare properly for teaching was the most frequently mentioned difficulty, indicates that many current teacher education programs should be evaluated as to course requirements concurrent with student teaching, the location of the school assigned for teaching, the credit hours allotted to the student-teaching course, and the number of weeks required for the experience.

3. Since quality-point index, score on the Minnesota Teacher Attitude Inventory, and score on the National Teacher Examinations had little effect upon difficulty the student teacher encountered in performing professional activities of this study, the use of these scores, either singly or collectively, as criteria for admission to the course in student teaching may be questioned.

4. The findings of this study should encourage educators to continue developing programs of student teaching for the individual rather than attempt to develop programs for groups of student teachers based on such factors as age, academic status, etc.

5. There is evidence in this study that cooperating teachers are not relinquishing to student teachers the activities of evaluating pupil growth in learning. This would indicate a need for college supervisors to work with the cooperating teachers toward increasing the experience in evaluating learning.

6. The fact that acquiring command of subject matter needed for class instruction and preparing daily lesson plans for teaching were more difficult at the end than at the beginning of student teaching indicates the importance of continued assistance with these activities by those supervising the student teacher.

FURTHER RESEARCH

From analysis of the data in this study, certain needs for further research and study seem to justify the following recommendations:

1. A national study which would effectively analyze student teachers' difficulties as related to various factors should be conducted in single purpose teacher education institutions as well as the multipurpose institutions.

2. Research should be conducted to analyze other factors that might have an effect upon difficulties encountered in student teaching. The effect of personality factors as related to difficulties of student teachers is a needed area of study.

3. Other research should utilize data provided by cooperating teachers as well as that provided by student teachers. A comparative study of difficulties identified by cooperating teachers and by student teachers could add validity to a study of this type.

THE READINESS OF FIRST-YEAR DEGREE TEACHERS FOR PROFESSIONAL ORGANIZATIONS: A COMPARATIVE STUDY OF MEMBERS AND NONMEMBERS OF THE STUDENT NATIONAL EDUCATION ASSOCIATION

by WILDA FREEBERN FAUST*

PURPOSES OF THE STUDY

This investigation was designed to measure the readiness of first-year degree teachers for participation in professional organizations.

The *primary purpose* was to investigate the extent to which the Student NEA (formerly known as the College Future Teachers of America or the National Association Future Teachers of America) has contributed to professional readiness of teacher candidates by comparing, within a total group of first-year degree teachers, those who had been Student NEA members with those who had never been members. The intent was to determine whether there were significant differences between the two groups in respect to certain hypotheses derived from the purposes and programs of the Student NEA.

The *secondary purpose* was to assess through findings of the study, present strengths and weaknesses in the accomplishment of Student NEA objectives in order to plan future programs which would be increasingly effective in the development of professional maturity and readiness requisite for early and competent participation in local, state, national, and special-interest professional associations.

RESEARCH PROCEDURES

The first step in the study was to establish basic hypotheses from the purposes of the Student NEA which could be tested by accepted research techniques in order to discover if such differences did exist and the extent to which they were significant. The chi-square formula was applied when appropriate to determine significant statistical differences.

Data were collected by means of a seventy-two item questionnaire. This tool apparently was related only to the readiness for professional, civic, and social responsibilities which any first-year degree teacher could reasonably be expected to acquire during undergraduate work. Unobtrusively, however, it was also directly related to the professional competences which the Student NEA seeks to develop. Therefore, each item in the questionnaire was related to one of the hypotheses postulated for the study.

The study was designed to include:

1. Fifteen representative states, geographically distributed, in which the Student NEA program was known to be strong, and thus may have had its effect on a substantial proportion of the students prepared to teach.
2. Only those 1957-58 first-year degree teachers within a selected state who had received their four-year degrees in 1957, from an approved teacher education institution within that state.
3. Only those first-year degree teachers identified as having been Student NEA

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members during at least their senior year of college, and only those first-year degree teachers identified as having never been members.

The study was also designed to permit matching of members and nonmembers of the Student NEA with regard to institution attended, academic grade average, and sex. Simple random sampling procedures were applied to the verified list of first-year degree teachers supplied by each of the fifteen states, through the cooperation of the state Student NEA consultant. The result was a total list of 4,148 names and addresses.

Matching of the questionnaires in terms of the student's self-estimated senior grade average and sex resulted in 425 pairs. Of these 175 pairs, of 41.2 per cent, were men; 250 pairs, or 58.8 per cent were women.

These pairs represented 73 accredited teacher education institutions in Arizona, Arkansas, Connecticut, Delaware, Florida, Kansas, Maryland, Minnesota, Montana, Nevada, Oregon, Rhode Island, Washington, West Virginia, and Wyoming.

FINDINGS

1. Membership in the Student NEA stimulated interest in other preprofessional college organizations representing the various fields of teaching, such as the students' major or minor areas of preparation. By the senior year Student NEA members averaged 1.16 other memberships—a total of 2.16—while nonmembers of the Student NEA group averaged less than one, or .89.

2. It was evident that teacher education students did not have many real preprofessional experiences, but Student NEA members had twice as many as did those who had never been members.

3. Many teacher candidates had neither the opportunities nor the incentives to participate in NEA and state association meetings, but the Student NEA members had attended twice as many such professional programs as had nonmembers.

4. Most of these first-year teachers—95.8 per cent of the Student NEA group and 80 per cent of the nonmembers of the Student NEA—were convinced that student attendance at NEA and state association meetings was from *some to considerable* value in the development of accurate concepts and understandings of professional organizations.

5. Membership in the Student NEA and participation in its programs and services clearly provided strong motivation for the use of literature developed by professional organizations.

6. Evidently far more personal prestige on campus, accrued to students who demonstrated professional interest by becoming Student NEA members. Although matched for their senior grade average, 61.5 per cent of the Student NEA contrasted with 39.7 per cent of the nonmembers were elected to national honors, such as Kappa Delta Pi, Phi Delta Kappa, Pi Lambda Theta, Phi Kappa Phi, Who's Who Among College Students, Key Clubs, and Mortar Board.

7. Identification with the Student NEA also seemed to open the door to greater financial backing. Student NEA members were the recipients of more scholarships than were nonmembers. Moreover, for Student NEA members, grants were of longer duration and of greater monetary value.

8. First-year degree teachers who had been Student NEA members were significantly more aware than nonmembers that strong, united, local, state, national, and special-interest education associations are essential to the improvement of the teaching profession.

9. Former Student NEA members held clearer concepts of the functional rela-

tionships which exist among voluntary teachers organizations than those who were never members.

10. Both groups were almost totally uninformed about the World Confederation of Organizations of the Teaching Profession. Student NEA members were better informed than those who had never been members, but only 10.6 per cent of the former and 5.9 per cent of the latter were at all acquainted with WCOTP.

11. Former Student NEA members had given significantly more study to the NEA Code of Ethics and were more capable than nonmembers of applying its principles to specific problem situations.

12. The Student NEA had significant effects on the readiness of first-year degree teachers for voluntary membership in professional organizations. In local associations 92.5 per cent of the Student NEA group joined, compared to 82.5 per cent of the nonmember group, a difference of 10 per cent. In the state associations 97.6 per cent of the Student NEA group joined compared to 83.3 per cent of the nonmembers of the Student NEA, a difference of 14.3 per cent. In the NEA 88.4 per cent of the Student NEA group joined in contrast to 57.2 per cent of the Nonstudent NEA group, a striking difference of 31.2 per cent. In the special-interest associations 45.2 per cent of the Student NEA group joined in contrast to 33.9 per cent of the nonmember group, a difference of 11.3 per cent.

13. The Student NEA also had significant effects on first-year degree teachers in respect to their active participation and acceptance of responsibilities in the local, state, national, and special-interest groups which they had joined.

In local associations former Student NEA members gave more time and effort and accepted greater responsibilities. Former Student NEA members also demonstrated greater faithfulness in attendance at local association meetings. Former Student NEA members reacted with more insight and understanding to the efforts of the local association to orient teachers to other professional organizations.

In the state education association, both groups of first-year degree teachers held high records of participation, but the Student NEA group continued to surpass the nonmember group.

In the National Education Association, because of various factors affecting participation in this huge organization, not many first-year teachers have opportunities to attend the NEA convention. Therefore, it was significant that three times as many of the Student NEA group as of the nonmember group had participated in this national meeting. Also that over one-fifth of the Student NEA group and approximately one-eighth of the nonmember group had, at this early stage in their careers attended one or more meetings of NEA departments or commissions.

14. First-year degree teachers who had been Student NEA members were significantly better prepared than nonmembers to face realistically and to share professional efforts to resolve problems and controversial issues.

15. A high percentage of both groups was convinced that a four-year minimum of basic preparation should be required of all candidates for the initial teacher credential.

16. The proposal of a fifth year of preparation for the full teacher credential was acceptable to only a minority of both groups.

17. A majority of both groups accepted the idea that agreements among the states on reciprocity of certification might well be based on graduation from accredited programs of teacher education.

18. Student NEA members rated their preparation significantly higher than did nonmembers. But, only 68.5 per cent of the former and 49.9 per cent of the latter

thought their college preparation had provided much to most of what they needed for effectively beginning their participation in professional organizations.

19. In respect to thirteen characteristics identified as inherent in all real professions, the most important fact was that both groups rated the teaching profession lowest in respect to *having developed a closely knit professional organization*, and next lowest in the extent to which it *improves the professional competences of its members*. In five characteristics the Student NEA group held significantly higher opinions of the status of teaching than did the nonmember group.

20. The Student NEA group significantly surpassed the Nonstudent NEA group in the intent to pursue graduate work. Of the former, 81.2 per cent and of the latter 70.3 per cent planned to earn the master's degree.

21. It was apparent that no strong motivation impels first-year degree teachers to associate themselves with civic groups within their teaching community. Even so, the Student NEA group significantly surpassed the Nonstudent NEA group in this indication of civic consciousness.

22. Both groups exhibited a high sense of civic responsibility by registering to vote, but the Student NEA group significantly surpassed the Nonstudent NEA group.

23. Very few of these first-year degree teachers were receptive to the concept of the educator as a candidate for public office. However, a statistical difference indicated that the members of the Student NEA group reacted less negatively than did the nonmembers.

24. Former members of the Student NEA surpassed nonmembers in their interest and participation in social groups within their teaching community, but a substantial majority of both groups did not join any such group.

25. Former Student NEA members were more likely to identify themselves with a church located in their teaching community than were nonmembers.

26. The first-year degree teachers who had been Student NEA members liked teaching more—were better adjusted and more satisfied with their first year of teaching experience—than were those who had never been Student NEA members.

27. Both groups liked teaching. Fifty-six per cent of the Student NEA group and 50.8 per cent of the Nonstudent NEA group liked teaching more than they had expected.

28. Former Student NEA members were significantly more likely, than nonmembers, to believe that they had chosen their career wisely.

29. Former Student NEA members were significantly more likely to teach a second year than were those who had never been members.

30. Former Student NEA members who leave the profession at the close of the first year of teaching tend to do so because of factors other than dissatisfaction with teaching, while those who had never been members, who decide to leave the profession at the close of the first year tend to have made that decision because of dissatisfaction with teaching.

31. Those who had been Student NEA members were, more likely, than those who had never been members, to believe that salaries commensurate with those of other professions with equivalent educational requirements are essential, but that other factors would have as much or more influence on their final decision to teach.

32. First-year degree teachers who had been Student NEA members had acquired significantly more pride in teaching than those who had never been members, but it was apparent that a number of both groups had not developed deep pride in their chosen profession.

33. Members of the Student NEA group had acquired significantly greater insight,

than those of the Nonstudent NEA group, into the important role of public education in the preservation and development of a free democratic society, but both groups clearly indicated the need for greater emphasis on this aspect of teacher preparation.

34. First-year degree teachers who had been members of the Student NEA possessed greater comprehension than did nonmembers, of their important personal role in the identification and guidance of potentially competent future teachers.

35. There was no significant difference between the two groups of teachers, in this study, in respect to the factors which they listed as most likely to attract and hold competent teachers.

36. Significantly more of the first-year teachers who had been Student NEA members, than of the nonmembers, had made the decision to teach before graduation from high school. Supporting data indicated that this reflects the influence of the high school Future Teachers of America.

37. It was apparent that first-year degree teachers in the Student NEA group significantly surpassed those in the Nonstudent NEA group in their conviction that the teaching profession has a basic responsibility to endeavor to maintain a reasonable balance between the supply of and demand for qualified teachers.

RECOMMENDATIONS FOR IMPROVING THE STUDENT NEA

In the light of the findings of the study and in order to provide greater involvement of leaders of the Student NEA, it is recommended:

1. That the National Commission on Teacher Education and Professional Standards consider the advisability of establishing for the Student NEA a Continuing Professional Council of ten members with provision for staggered terms, similar to those now in effect for the NCTEPS. The suggested charge to this Student NEA Professional Council might be: (a) to study, in depth, the Student NEA, its appropriate relationship to the NEA and its interrelated professional organizations, and (b) keeping in mind the contributions the Student NEA should make to the professional development of its members, and to the advancement of the total teaching profession, this Council should make periodic recommendations for its further development. Such recommendations should be directed to the national director of the Student NEA, the executive secretary of NCTEPS, the NEA assistant executive secretary for Professional Development and Welfare, and the executive secretary of the NEA.

In order to assure continuity of professional in-service leadership, it is suggested that the composition of this council include:

A state consultant, nominated by the state consultants

A local adviser, preferably the adviser to the chapter of which the president of the Student NEA is a member

The dean of an NCATE accredited institution, nominated by the NCATE

An executive secretary of a state education association, nominated by the National Association of Secretaries of State Teachers Associations

One NEA staff member representing the NEA departments and/or other units which offer membership or services to students who are preparing to teach, to be nominated by the heads of these units

An NEA staff member representing local teachers associations, nominated by agreement between the consultant for local association and the executive secretary of the department of Classroom Teachers

One state TEPS chairman, nominated by the state TEPS chairmen

One member of the NCTEPS, appointed by the Commission

The president of the Student NEA

The vice-president of the Student NEA (who it is hoped will by policy, or constitutional provision, succeed the president).

The national director of the Student NEA, with approval of the executive secretary of NCTEPS, should coordinate the council, announce time and place of meetings, develop agendas, and serve as administrator for the evolving organization and programs.

2. That the National Commission on Teacher Education and Professional Standards explore, through appropriate NEA channels, the possibility of developing for the Student NEA a closer structural and functional relationship to the National Education Association. The basic purposes would be: (a) to focus the goals and programs of the Student NEA on the total efforts of the NEA and its affiliated associations as they strive for national unity in achieving the over-all goals of education and of the organized profession, and (b) to clearly define the status of the Student NEA as a unit of the NEA.

This might be accomplished (a) by establishing the Student NEA as a department or division of the NEA under the direction of the assistant executive secretary for Professional Development and Welfare, (b) continuity of professional leadership could be maintained by the Continuing Professional Council as suggested above.

3. That the Commission on Teacher Education and Professional Standards continue to take the initiative in developing an *all inclusive plan for Student NEA membership* which, for one fee, will offer membership in the state education association, the National Education Association and an NEA department, or other unit, which represents one of the student's major areas of teacher preparation. (This would constitute an extension of present practice in which, for one fee, a student becomes a member of both the NEA and his respective state education association.)

4. That a statement of the professional philosophy, objectives, goals, and policy of the Student NEA, together with criteria for the identification, selection, and preparation of qualified advisers be placed in the hands of all deans of accredited teacher education institutions, so that they may be guided in their efforts to secure outstanding professional leaders for the local chapter.

5. That professional attention be focused on the importance of involving Student NEA chapter advisers in the development of the total Student NEA program, including the possibility of bringing key advisers from each state to an annual national leadership conference.

This could be initiated by inviting at least one adviser from each state to participate in either the Pre-TEPS and TEPS conference or in the biennial national meeting of state consultants. Such a key leader might be the adviser from the chapter of which the state student president is a member, or the president of the state advisers organization, or an adviser who is a member of the state TEPS Commission.

It is further suggested that all advisers be afforded the opportunity to participate in annual statewide or regional advisers work conferences.

6. That the National Commission on Teacher Education and Professional Standards explore with state and local TEPS commissions effective ways by which state consultants and local advisers could become more involved in the activities and programs of TEPS, and that the advisers in turn explore ways to involve state TEPS leaders in Student NEA programs.

SUMMARIES OF DISSERTATIONS
SUBMITTED FOR
THE DEGREE OF
DOCTOR OF BUSINESS ADMINISTRATION

SMALL BUSINESS INVESTMENT COMPANIES AND AN EVALUATION
OF THE SMALL BUSINESS INVESTMENT ACT OF 1958 WITH A
BACKGROUND STUDY OF PUBLIC POLICY AFFECTING
SMALL BUSINESS, ITS ROLE, AND THE AVAILABILITY
AND ADEQUACY OF FINANCING

by JOEL ELMORE ROSS*

The Small Business Investment Act of 1958, as amended, is the most recent federal effort to aid small businesses in the area of financial problems and the institutional vehicle chosen to implement this act is the Small Business Investment Companies (SBIC's). This investigation evaluates these companies and the Act against a background concerned with the role of small business in the American economy and some of the factors affecting that role. Further, the institutional framework for financing small firms is examined, and an attempt is made to evaluate the adequacy of this financing.

No generally accepted definition of small business exists. The most commonly used measures of whether a firm is "small" are size of firm, value of assets, employees, sales, extent to which it is dominant in its field, and extent to which independently owned and operated. The definition of the Small Business Administration generally provides that a firm is small if it is independently owned and operated, has not made a public offering of its stock or traded such stock on an exchange, has assets of less than \$5 million, or average profits for three years of less than \$150,000.

SMALL BUSINESS IN THE AMERICAN ECONOMY

There are today over four million business firms that by almost any definition would be classed as small, and the vast majority of these are routine and competitive. There is a fringe of pioneering or growth concerns, primarily in manufacturing industries, and it is this fringe which is most important for considerations of public policy, including financing.

In terms of broad averages, the growth of the small business universe follows the growth in real demand and output and the human population. Factors affecting this growth are stable and there is little danger of the diminution of their numbers or importance. There are some shifts in the relative importance of small business sectors, particularly manufacturing, but generally small business is holding its own by almost any measure. The failure and turnover rate is not growing relatively larger and is less than that of the pre-World War II rate.

Tax laws, frequently blamed for financing difficulties, are neither discriminatory nor inequitable although there is evidence that these laws are stifling the growth of some firms because of their inability to retain earnings for growth. This in turn makes it difficult for them to obtain long-term debt or equity funds.

Economies of scale do not threaten the position of small business with the possible exception of manufacturing. In this latter sector a substantial portion of the output is produced by small businesses. A greater proportion is produced in the

* A.B. 1936, Yale University. M.B.A. 1959, The George Washington University; D.B.A. conferred June 7, 1961. Research advisory committee: Arlin Rex Johnson, Professor of Business Administration; Roy Brandin Eastin, Professor of Business Administration.

trades and services because convenience and location may be relatively more important. As a practical matter, economies of scale notwithstanding, small businessmen enjoy certain advantages over the larger one, primarily the flexibility for sudden changes to meet changing production or market conditions.

PUBLIC POLICY REGARDING SMALL BUSINESS

Public policy concerning small business has evolved from the national character which has always expressed concern over the danger and abuses of economic power. This has resulted in our long-standing and current concern over antitrust enforcement and other measures to insure free competition and the containment of market power.

Prior to the depression of the 1930's, public policy took the form of protecting small business against the abuses of concentration. The fact that it might have aided small firms was perhaps incidental. Commencing in the depression of the 1930's, there arose the desire to do something positive for this sector. This concern was culminated in 1953 by the establishment of the Small Business Administration.

Concentration and monopoly have not increased in the United States and show no tendency to do so. The benefits envisaged by free competition, free allocation of resources to best alternative uses and efficiency would probably not be improved by increased measures to reverse a supposed trend of concentration and there may be some economic disadvantages in further penalizing big business.

Unless the basic philosophy of our Government and the premise of free competition should change, small business as an economic sector should not be singled out for further special treatment merely because it is small nor should big business be subjected to legislative enactments merely for the sake of curbing bigness.

FINANCING SMALL BUSINESS

The most important sources of the outside financing for small business are inter-business financing and commercial banks in that order, and the overwhelming amount of funds comes from these two sources.

Most banks are small business units themselves and are oriented to small business. They have developed a variety of lending techniques and new methods of operations to make predominantly short-term credit available to the creditworthy borrower, and this type of small firm usually has no difficulty in obtaining approval of a loan application. Trade credit, which not only finances purchases but releases funds for other uses, is perhaps the most important source of credit. Again, this credit is available in a variety of ways and new techniques and organizations are developing to accommodate the creditworthy purchaser. Although probably not as flexible as bank credit, open book and other trade credit is readily available to most firms to the extent of their purchases.

Commercial finance companies and factors are an important source and the use of these institutions is growing. As financial intermediaries and wholesalers of money, they make credit available which otherwise might not be furnished. Generally, it is the firm above the asset size of about \$350,000 which makes the most use of this source. Although finance company and factor credit may appear to be high in cost, particularly for accounts receivable financing, this is not necessarily the case when terms and services are taken into account.

Except for mortgage loans, life insurance companies are not a significant source of credit to small business. Industrial development corporations, handicapped by

their inability to tap the capital markets, are not quantitatively important although their numbers are growing. This new type of institution may be more important at a later time. Small Business Administration loans have not been significant.

The securities market is generally not available to the small firm which needs less than \$100,000; above that amount only the "larger" small firms are likely to succeed in tapping this source. For issues in the \$100,000 to \$1 million size, the cost of flotation is substantially greater than larger issues and for firms attempting issues in these amounts, the prospects of growth must be above average. Debt securities are practically unavailable to the small firm.

The quantity of venture capital cannot be estimated. Numerous outlets exist from this source but venture capital is available to only a few of those who apply and then on rather stiff terms.

ADEQUACY OF SMALL BUSINESS FINANCING

The majority (probably about 80 per cent) of small firms have no need for additional outside financing. Those which do and those which are unsuccessful in obtaining this financing are generally less creditworthy. Despite the overwhelming demand for long-term credit, it is probable that the real need is for equity capital, but small firms shy away from this type of financing because of a fear of losing control and the belief that equity financing is unavailable to them.

Short-term credit through bank loans, trade, and other sources is generally adequate for the creditworthy small firms. Institutions furnishing this credit are presently sufficient.

In the area of long-term credit and equity financing, there is a margin of small firms, primarily in the manufacturing industries, whose justifiable needs are not being adequately met. This is due in part to the lack of organized sources. In view of this lack and the need for sound business advice, the Small Business Investment Act of 1958, as amended, and the Small Business Investment Companies are probably administratively and politically practical devices for providing both funds and an institution to channel these funds into the small business sector.

SMALL BUSINESS INVESTMENT COMPANIES

Enabling legislation for these companies was enacted on August 17, 1958, and as of May 11, 1961, 240 SBIC's had been licensed.

Public companies have had varying degrees of success in marketing common stock issues and maintaining the market price. Those companies having firm underwriting commitments have fared best. Two or three companies in the "glamour" industries have had most of the publicity in the financial press and consequently much of the market success. A substantial number of private companies plan to make public issues of stock in 1961.

Although the bulk of SBIC's offer a variety of management consulting and advisory services, the majority of small concerns make no use or only infrequent use of these services because of the belief that the services are not needed.

In order to conclude the best investments, SBIC's are faced with two conflicting but necessary tasks: screening out the overwhelming majority of applicants, yet seeking ways to encourage more prospects to apply for financing. Banks and stockholders are the major sources for contacting prospects. The majority of SBIC's have no set policy with regard to investment in new or established firms. In spite of the organization and experience required to cover a broad spectrum of industries, the vast majority of companies plan to do so. Most companies emphasize

capital appreciation rather than interest income. This reflects the widely held view that capital gains is the only route through which an SBIC can prosper.

Although the tax incentives offered SBIC's and the stockholders of SBIC's are essentially negative, it is probable that tax benefits have induced a substantial number of persons to invest in these companies. Hence, the objective of stimulating private capital into small business has been encouraged.

The vast majority of SBIC's have invested only a fraction of the funds available to them, and few have taken advantage of the leverage available from SBA. Although most SBIC's do not require additional leverage at the present time, they will ultimately need it. Those which have attempted to borrow money have been unsuccessful due primarily to the newness of the program. A substantial number plan to increase their leverage from the sources of banks and SBA; only a few plan issues of debt securities at this time.

SBIC's indicate that substantially more than half of the financing provided to small concerns in the future will be by means of equity securities rather than long-term loans and the majority of both of these instruments will be secured. This reflects the greater flexibility permitted by the 1960 amendments to the SBI Act of 1958, as well as the desire of SBIC's to be protected on the "downside" by collateral and on the "upside" by equity participation in growth. Most SBIC's anticipate using a package participation instrument which includes a basic loan with warrants, rights, or options to convert to stock.

Average interest rate for loans is slightly higher than for equity securities. The majority of financing of both types was effected at rates that do not appear to be excessive.

Generally, small business concerns are interested in the new source of financing and many of them plan to utilize it. However, only a small fraction of those which apply for financing obtain it. SBIC's estimate that the overwhelming majority of firms to which they have lent money or in which they have invested would have been unable to obtain financing on similar terms from any other source.

The reasons for the high rejection of financing applications from small firms are the same as those prevailing throughout the financing industry and involve the creditworthiness of the borrower. To obtain financing from any source, including SBIC's, a small firm should have good management, a high degree of owner equity, a record of good earnings, and a good competitive and profit outlook.

By almost any measure, the operating success of SBIC's has been poor. This record should not be taken as a prediction of the future, however, because of the relatively short time during which these companies have been operating, the belief by many that a necessary period of incubation is required for capital gains, and the probability that many SBIC's are being operated on a reduced basis by parent companies.

THE SMALL BUSINESS INVESTMENT ACT OF 1958, AS AMENDED, AND ITS ADMINISTRATION: AN EVALUATION

Based on the premise that an institutional deficiency exists for filling the proven need for long-term loans and equity capital for small businesses, the conclusion emerges that the Small Business Investment Act of 1958 has made a relatively small contribution toward filling that need. Total loans and investments by all SBIC's as of September 30, 1960, was 724 in a total amount of \$31.6 million. As of December 31, 1960, the total amount was \$51.3 million.

Two possible reasons are advanced to explain the poor showing thus far: the manner in which the act has been administered by the SBA and the statutory provisions of the act itself.

The initial favorable public reaction turned to one of skepticism amid charges of "red tape" and allegations that the SBA had adopted stringent regulations out of sympathy with the act. Further, it was alleged that the SBA had not displayed aggressiveness in administering the act or in proposing measures to aid the program.

The SBI Act contains statutory provisions which are too restrictive to permit the necessary flexibility between SBIC's and small firms. Because the act involves an entirely new field and the possibility of abuses was present, these restrictions were proper at the time. Realizing that some changes were necessary, the Congress amended the act in 1960 to permit more flexibility. If the objective of the act is to be achieved more rapidly, additional amendments are necessary to encourage the attraction of capable management and permit the financial success of SBIC's. This is a pioneering field and perhaps pioneering action is required.

Foremost among those measures which are needed to stimulate the program and ultimately the flow of more private capital into small business is the provision of additional leverage through SBA funds. Notwithstanding the existing invested position of most SBIC's, it is probable that many of them are overly cautious in financing small firms because of the view that leverage will not be forthcoming from private or government sources. By providing this leverage, the SBA will not only stimulate the program but will demonstrate to the private investment community that the government has faith in the SBIC's. In this regard, the current 100 per cent asset coverage for SBA loans should be dropped. This regulation not only makes it a practical impossibility for most SBIC's to pledge these assets for leverage from private sources but sets a precedent likely to be copied by the normal sources of leverage.

Legislation authorizing the "pass through" of capital gains and the establishment of a nontaxable bad debt reserve should be enacted. SBIC's are defined as investment companies and many of them are regulated under that legislation. The capital gains advantage enjoyed by these companies should be available to SBIC's. Moreover, such legislation would provide a positive tax benefit and probably result in a net increase in tax revenue. Current statutory provisions permitting SBIC's to deduct losses against ordinary income should be accompanied by correlative provisions to establish a reserve against these losses. Such permission is now granted to the relatively "safe" banking industry, and the establishment of the reserve is nothing more than the dictates of prudent management demand.

Action should be taken to permit restricted stock options for those SBIC's registered under the Investment Company Act of 1940. This manner of reimbursement is a necessary one to attract capable management required in this difficult and, thus far, unprofitable field. Restricted stock options preclude the abuses envisaged by this act when it was enacted in 1940.

SBIC's should be permitted to participate in SBA loans to small concerns. This action would provide additional fees to the SBIC's and advance the goal of less government financing of small business.

The current limit on financing by an SBIC is 20 per cent of capital and surplus, resulting in a situation where more than 77 per cent of these companies are restricted to a limit of \$60,000, much less than the amount required for most growing manufacturing firms which form the core of the small business financing problem. Raising this limit may result in financing to fewer small firms. The SBA should devote further study to these opposing objectives and recommend legislation, if desirable. In this connection, additional leverage furnished by the SBA would relieve this anomaly.

A STUDY OF EXPORT TRAFFIC MANAGEMENT POLICY OF SELECTED MANUFACTURING FIRMS

by ROBERT ADOLPH KAYE*

INTRODUCTION TO THE PROBLEM

The problem with which this dissertation is concerned pertains to one aspect of export business policy—that of export traffic management. The importance of a study in this field at this time is reflected in the emphasis being placed on export trade as a part of national policy. Persistent deficits in the balance of payments position of the United States are of considerable concern to the Executive Branch of the Federal Government. A primary source contributing to remedying the balance of payments problem is believed to be that of the export trade of the United States. President Kennedy, in stressing this point, stated that maximum emphasis must be placed on expanding our exports. The President further stated that our costs and prices on exports must be kept low. In view of this expression from the President, the American exporter should review the adequacy of his export policy and take steps to increase export business wherever possible.

As a part of the over-all problem, this study undertook to (1) determine certain export traffic management policy characteristics of selected firms, (2) ascertain similarities of such company policy within and among industries, and (3) suggest potential contributions of effective export traffic policy toward increasing export business of the firm. Fifty-one firms cooperated in the study.

EXPORT TREND AND BALANCE OF PAYMENTS BACKGROUND

The problem and its setting were clarified by background information on the trend of United States exports and the balance of payments position. The levels of United States exports from 1900 to the present time were discussed. During the past sixty years, with the exception of 1930 and the 1957-1959 periods, the dollar volume of United States exports has generally increased. The particular concern of the study, however, was with the 1957-1960 period. The general slump in export trade which occurred after mid-1957 did not materially recover until 1960. The export trade promotion efforts of the United States Department of Commerce in implementing the national policy plus the renewed efforts of the firms in the field of exporting undoubtedly did much to bring this about.

The United States balance of payments position did not fare quite so well. A deficit in varying amounts has persisted over the past decade. This condition was not considered serious until the past few years when an increasing amount of gold was flowing from United States reserves. It was with the realization of this near crisis that the previous and present administrations suggested that the United States national interest would be better served by a sustained increase in commercial exports. Notwithstanding the marked improvement in the United States export surplus in 1960, the balance of payments deficit virtually remained unchanged. However, had it not been for increased exports, the picture would have been considerably worse.

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EXPORT POLICY CHARACTERISTICS OF SELECTED FIRMS

In pursuing the study, export traffic management policy characteristics of the firms were developed from certain policy standard benchmarks. Generally accepted export policy standards, in addition to export traffic management, were identified as being related to maximization of profit, decision to enter foreign trade, adaptation to foreign demand, dedication of productive capacity to export trade, export pricing and export credit policy. Export traffic management policy, however, was believed to be reflected in the form of export traffic organization under which a given firm operates, the type and extent of company control over routing of traffic, the manner in which the enterprise generally specifies terms of delivery of its products, the alertness of the firm to freight rate adjustments and the extent to which export traffic management provides assistance to the over-all organization.

The following policy statements were used as the basis for evaluating export traffic management policies:

1. Export traffic management shall be responsible for carrying out the export traffic functions of the firms within the approved over-all organizational framework of the firm.

2. Export shipments shall be routed by the most efficient and economical method commensurate with service requirements, and routes selected shall assure expeditious service.

3. Export traffic management shall be responsible for comparative transportation cost calculations for the various forms of price quotations and shall recommend the specific quotation and mode of transportation which is determined to be of the greatest competitive advantage to the firm.

4. Export traffic management shall be responsible for conducting rate negotiations where appropriate with transportation companies to seek reasonable relief from existing levels of rates.

5. Export traffic matters at various levels and within various departments of the firm shall be coordinated with export traffic management for guidance, assistance, review, comment, or concurrence.

An evaluation of export traffic policy was based upon the above criteria. Each of these standards was applied in a review of the firms as a whole, resulting in the following observations: (1) only three firms were found to be without a company export traffic organization; (2) about 80 per cent of the firms were active in export traffic routing, however, more firms route inland traffic as opposed to ocean traffic; (3) the majority of firms did not use C.I.F. terms of delivery, F.A.S. terms were most popular; (4) ocean freight rate negotiations were pursued more actively than were inland negotiations; and (5) in only a small per cent of the firms was export traffic assistance used to a minimum extent or virtually ignored.

EXPORT TRAFFIC POLICY WITHIN AND AMONG INDUSTRIES

The relative size of the firms was reflected in terms of annual dollar sales volume. In addition, the per cent of total dollar sales exported reflected the extent to which these firms engaged in export trade. Thirty-nine of the fifty-one firms were found to be included among Fortune Magazine's Directory of The 500 Largest United States Industrial Corporations. About 75 per cent of the total number of firms were found to export between one and ten per cent of their total sales, the majority of which were within the 5 to 10 per cent range.

Having determined the relative size and levels of export activity of the firms, and

the export traffic, policy characteristics of the firms as a whole, the latter problem was further treated within and among the following three groups; (1) Industrial and Construction Machinery, (2) Chemical Manufacturing, and (3) Metal Manufacturing Industries. There was a marked degree of similarity of export traffic management policy both within and among industry groups to the extent that an over-all typical firm was determined to be essentially as follows: a firm organized on a built-in freight forwarder basis, exercising complete routing control on sales delivered F.A.S. vessel, engaged in transportation rate adjustments, and frequently furnishing export traffic management assistance to the firm.

EXPORT TRAFFIC MANAGEMENT CONTRIBUTION TO EXPORT TRADE

In developing the contribution of export traffic management to export trade the relative importance of the policy standards to each other was determined to establish a realistic priority framework within which to evaluate the firms. Further, examples of potential profitability of effective export traffic management and guidelines suggested ways for increasing export traffic management's potential worth in export trade promotion.

The relative importance of the five export traffic management policy standards were as follows: terms of delivery, rate adjustments, routing, staff assistance, and form of organization.

An appraisal of the firms' export activities revealed that, from an operational point of view, the results were generally satisfactory. However, the one single important exception was found to be the lack of an extensive use of C.I.F. business practices.

Numerous examples pointed out the transportation cost-reduction potential that could result from using the C.I.F. laid-down-cost technique. Included in the various cost reduction illustrations were such export traffic management principles as (1) differences in inland transportation costs from one origin to different ports, (2) rail minimum weight factors, (3) transcontinental rail rate combination with overland ocean freight rates, (4) tariff rates geared to specific boxing condition, (5) reducing cubic measurement by removal of protruding parts, (6) profitability of buying air, (7) trailer-car rates, and (8) reducing the total weight of a single package by disassembly to reduce ocean carrier heavy lift charge.

Export traffic management guidelines in the study required the export traffic department to relate all institutions connected with transportation to the firm's export objectives. Where transportation resources can aid in selling abroad, it is the duty of export traffic management to interpret such to the management of the company. The American Merchant Marine is one such institution and resource. A network of contacts abroad along the major trade routes is characteristic of shipping companies, and exporters should utilize these contacts to the best advantage. Another course of action is to reduce landed costs of export shipments by taking advantage of delivered-to-destination terms of sale.

CONCLUSIONS

Based on observations, findings, and suggested guidelines, effective export traffic management offers a good potential for promoting export business. The use of transportation cost-reduction techniques in conjunction with appropriate export terms of delivery quotations coupled with public promotional efforts (including special emphasis features on this potential) are basic to the attainment of this goal. Further,

cooperation of the transportation industry should be obtained in suggesting ways and means for the shipper to transport his goods at the least cost.

Appropriate implementation of these elements will tend to have a multiple-end effect on United States export trade by (1) providing a desirable service to the foreign customer, (2) affording the exporter an opportunity to be more competitive, (3) stimulating export trade and providing additional business opportunities to collateral industries, and (4) contributing to the advancement of national policy.

The study concludes that export traffic management is not a panacea with respect to the problem of increasing United States commercial export trade. However, it is believed to be an important contributing factor frequently minimized. Some firms have over-all effective export traffic policy—many do not. The need for such is apparent and, if recognized, the results could be surprising.

THE GEORGE WASHINGTON UNIVERSITY, 1821

COLUMBIAN COLLEGE OF ARTS AND SCIENCES, 1821

THE GRADUATE COUNCIL, 1893

THE SCHOOL OF MEDICINE, 1825

THE NATIONAL LAW CENTER, 1960

THE LAW SCHOOL, 1865

THE GRADUATE SCHOOL OF PUBLIC LAW, 1960

THE SCHOOL OF ENGINEERING, 1884

THE SCHOOL OF PHARMACY, 1906

THE SCHOOL OF EDUCATION, 1907

THE SCHOOL OF GOVERNMENT, BUSINESS, AND
INTERNATIONAL AFFAIRS, 1928

THE COLLEGE OF GENERAL STUDIES, 1950

THE DIVISION OF UNIVERSITY STUDENTS, 1930

THE DIVISION OF SPECIAL STUDENTS, 1944

THE DIVISION OF AIR SCIENCE, 1951

THE SUMMER SESSIONS, 1916

THE UNIVERSITY HOSPITAL, 1898

